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DIGITAL ECOSYSTEM COUNTRY ASSESSMENT (DECA)

Serbia

AUGUST 2021

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ACRONYMS

2G	Second-generation
3G	Third-generation
4G	Fourth-generation
5G	Fifth-generation
AI	Artificial Intelligence
BIRN	Balkan Investigative Reporting Network
CDCS	Country Development Cooperation Strategy
CeSID	Center for Free Elections and Democracy
CFG	USAID Cooperation for Growth Project
CIC	Center for the Investigation of Corruption
CSO	Civil Society Organizations
DCCP	Digital Connectivity and Cybersecurity Partnership
DDI	USAID Bureau for Democracy, Development, and Innovation
DDI/ITR	Innovation, Technology and Research Hub (in DDI)
DECA	Digital Ecosystem Country Assessment
DFS	Digital Financial Services
DO	Development Objective
DNS	Domain Name System
DSL	Digital Subscriber Line
DSP	Digital Society Project
DSR	Digital Silk Road
EU	European Union
FAQ	Frequently Asked Questions
FIRST	Forum of Incident and Response Security Teams
FOI	Freedom of Information
FSP	Financial Service Provider
FTTP	Fiber-to-the-premises
FTTx	Fiber To The X
GDA	Global Development Alliance
GDP	Gross Domestic Product
GDPR	General Data Protection Regulation
GIZ	*Deutsche Gesellschaft für Internationale Zusammenarbeit*
GONGO	Government-Organized Non-Governmental Organization
GSB	Government Services Bus
GSMA	Global System for Mobile Association
ICANN	Internet Corporation for Assigned Names and Numbers
ICO	Initial Coin Offering
ICT	Information and Communications Technology
ID	Identification
IGF	Internet Governance Forum
IoT	Internet of Things
IP	Internet Protocol
IR	Intermediate Result
IRM	Independent Reporting Mechanism
ISP	Internet Service Provider
IT	Information Technology
ITU-T	International Telecommunication Union Telecommunication Standardization Sector
KII	Key Informant Interview
KRIK	Crime and Corruption Reporting Network
LASER	Long-Term Assistance and Services for Research
LGBTQI+	Lesbian, Gay, Bisexual, Transgender, Queer, Intersex +
LLC	Limited Liability Company
LTE	Long-Term Evolution
MFI	Microfinance Institution
ML	Machine Learning
MNO	Mobile Network Operator
MoIA	Ministry of Internal Affairs
MoTT	Ministry of Trade, Tourism and Telecommunications
MSI	Media Sustainability Index
MTTT	Ministry of Trade, Tourism, and Telecommunications
NALED	National Alliance for Local Economic Development
NBS	National Bank of Serbia
NFC	Near Field Communication
NCSI	National Cyber Security Index
NGO	Non-Governmental Organization
OCCRP	Organized Crime and Corruption Reporting Project

OITeG	Office for IT and eGovernment
PDF	Portable Document Format
PII	Personally Identifiable Information
POC	Point of Contact
ProICT	Promoting American Approaches to ICT Policy and Regulation
PSB	Public Service Broadcasting
QR	Quick Response
RATEL	Regulatory Agency of Electronic Communication and Postal Services
RNIDS	Serbian National Internet Domain Registry Foundation
SDG	Sustainable Development Goals
SDIS	Strategy for the Development of Information Security
SEEDIG	South Eastern European Dialogue on Internet Governance
SME	Small and Medium-sized Enterprises
SMS	Short Message Service
SMS	USAID Strengthening Media Systems Project
SNS	*Srpska Napredna Stranka (Serbian Progressive Party)*
SRB-CERT	Serbia's National Computer Emergency Response Team
STEM	Science, Technology, Engineering, and Mathematics
TF	Trade Facilitation
USAID	United States Agency for International Development
USF	Universal Service Fund
WBIF	Western Balkan Investment Framework
WiMAX	Worldwide Interoperability for Microwave Access
WTO	World Trade Organization

Executive Summary

BACKGROUND

The U.S. Agency for International Development's (USAID's) Digital Strategy launched in April 2020 with the goal of supporting our partner countries through their digital transformations. It aims to improve measurable development and humanitarian assistance outcomes through the responsible use of digital technology and to strengthen the openness, inclusiveness, and security of partner country digital ecosystems.

The Digital Ecosystem Country Assessment (DECA), a flagship initiative of the Digital Strategy, informs the development, design, and implementation of USAID's strategies, projects, and activities. The DECA looks at three pillars of a nation's digital ecosystem: (1) digital infrastructure and adoption; (2) digital society, rights, and governance; and (3) digital economy. The DECA aims to inform how USAID/Serbia programming can understand, work with, and strengthen the country's digital ecosystem. The DECA does not evaluate or suggest modifications to existing programs, but rather assesses a country's digital ecosystem and identifies how a USAID Mission's future programming can build upon or strengthen that ecosystem.

The USAID/Serbia 2020-2025 Country Development Cooperation Strategy (CDCS) includes two strategic priorities:

1. increasing the resiliency of democratic actors; and
2. increasing equitable prosperity.

KEY FINDINGS

DIGITAL INFRASTRUCTURE AND ADOPTION
• Government and industry plans to deploy fifth-generation (5G) networks have been delayed due to COVID-19. This delay creates a window for multi-stakeholder engagement to ensure adoption of secure 5G. • Huawei's significant role as contractor, supplier, and advisor for digital connectivity resources highlights China's influence on Serbia's critical digital infrastructure. • COVID-19 has spurred swift adoption of distance learning, but more action is needed to ensure child safety online and the inclusion of marginalized communities.
DIGITAL SOCIETY, RIGHTS, AND GOVERNANCE
• Prime Minister Ana Brnabić prioritizes digital government, but the lack of a unified, government-wide strategy impedes progress. • Efforts for increased interoperability between government systems exist; however, digitalization initiatives remain siloed and lag at the local level. • In most cases, internet governance policies do not meet international standards. • Civic opening in the protection of digital rights and freedoms is critical to preserving democratic space.

DIGITAL ECONOMY

- Tech startup entrepreneurs often lack business acumen, hindering the growth of startups. The key to startup success (according to top innovation hubs in the country) is having a diverse team across educational background, skill sets, and gender.
- Funding constraints are a major issue for most tech startup entrepreneurs. There are few investment funds with varying funding limits and a general lack of government policy to incentivize investment.
- Trauma from past financial crises inhibits citizen uptake of digital finance, including digital crowdfunding.
- The e-commerce sector has progressed significantly during the COVID-19 pandemic. Improvements in regulation, digital literacy, supply-side logistics, and consumer awareness are needed for the sector to fully thrive.

The Serbian government prioritizes digitalization. Serbia's digital transformation accelerated in 2017 with the government's focus on building a digital government, or "digitalization" as defined by Serbians, and Serbia's participation in the Digital Agenda for the Western Balkans. As one Serbian official described it, digitalization refers to the "fundamental changes reflected in the emergence of an efficient, economical, and transparent public administration." Although there is no comprehensive national policy for Information and Communications Technology (ICT), Serbia's digital agenda includes initiatives ranging from expanding connectivity to developing the ICT industry. Prime Minister Brnabić has been a champion for digitalization, and digital transformation will continue to be a key priority in the coming years.

Digital connectivity infrastructure in the country is strong and growing. Fourth-generation (4G) mobile broadband covers more than 90 percent of the population. The government and top mobile network operators (MNOs) plan to deploy 5G networks in the near future. Donors such as the European Union (EU) support the expansion of fiber-optic connectivity to connect rural schools. China's Digital Silk Road Initiative has had a substantial role in building Serbia's digital infrastructure, ranging from Safe City infrastructure to providing cloud infrastructure and developing an artificial intelligence (AI) platform for the government. During the COVID-19 pandemic, the government swiftly embraced online schooling and expanded digital government services.

Fragmentation and uneven levels of buy-in across the executive branch hinders Serbian digital government efforts. Serbia's approach to multi-stakeholder internet governance has also been uneven, with industry and civil society stakeholders lamenting a lack of public engagement.

Serbian civil society is working to protect digital rights and freedoms. A growing network of organizations in Serbia and across Southeast Europe is working to protect free expression online, promote information security, and publicize digital rights violations.

Digital technology is strengthening Serbia's business environment. Serbia boasts the fastest-growing ICT industry in the Western Balkans region and a strong ICT talent pool. Belgrade's startup community has a bright future if entrepreneurs get the support they need. The general business environment has been slow to transform digitally. The onset of COVID-19 has illustrated the benefits of digitalization and improved the outlook among regulators, entrepreneurs, and consumers. Barriers remain for digital trade and e-commerce, including a lack of trust in digital financial tools and uncertainty about Serbia's accession to the World Trade Organization.

USAID/Serbia should continue to engage and strengthen Serbia's digital ecosystem. This effort includes a digital COVID-19 response to strengthen online education and e-health. USAID can support the government's digital transformation and advocate for a secure, inclusive, and open future. There is untapped potential in Serbia's digital economy, and USAID/Serbia can help by building on existing work and fostering new opportunities for growth.

ROADMAP FOR THE REPORT

Section 1 provides background on the DECA framework and goals. It includes a summary of USAID/Serbia's priorities, connecting them with digital solutions.

Section 2 presents the key findings about Serbia's digital ecosystem. This section is organized into three subsections by DECA pillar: digital infrastructure and adoption; digital society, rights, and governance; and digital economy.

Section 1:

About this assessment

USAID's Digital Strategy aims to improve measurable development and humanitarian assistance outcomes through the responsible use of digital technology and to strengthen the openness, inclusiveness, and security of country digital ecosystems. The Digital Strategy (and the DECA) is part of USAID's holistic approach to help achieve the Sustainable Development Goals (SDGs).

As part of the Digital Strategy implementation, the DECA examines three broad areas to understand the opportunities and challenges in a country's digital ecosystem:

1. Digital Infrastructure and Adoption
2. Digital Society, Rights, and Governance
3. Digital Economy

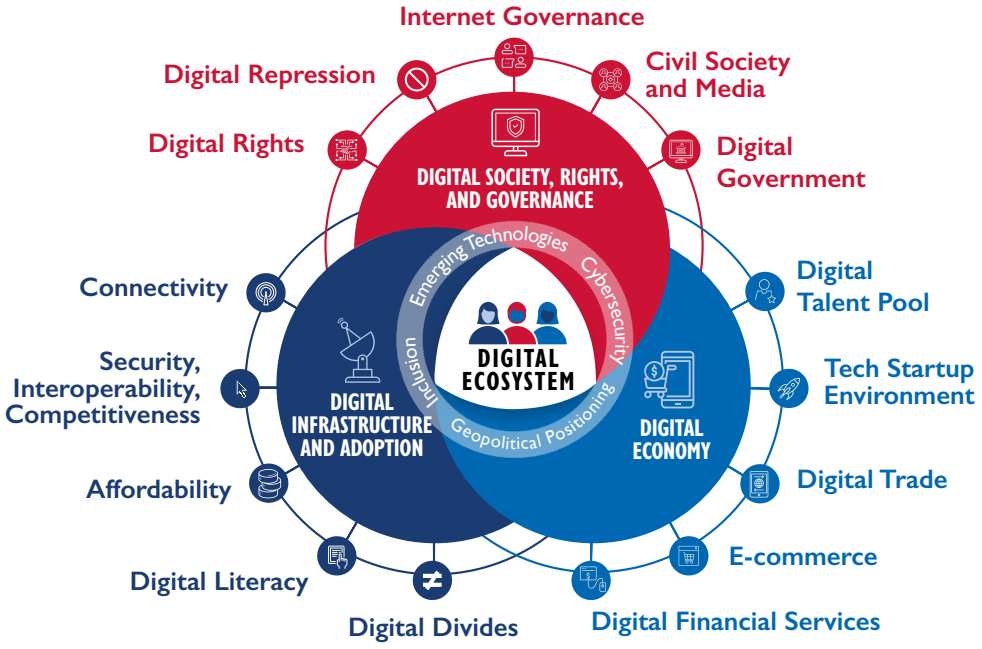
What is a digital ecosystem?

A digital ecosystem is comprised of stakeholders, systems, and an enabling environment that together empower people and communities to use digital technology to access services, engage with each other, and pursue economic opportunities.

The Serbia DECA took place between May 2020 and November 2020. It included desk research, consultations with USAID/Serbia, and about six weeks of virtual key informant interviews. It involved a total of 59 interviews with stakeholders from civil society, academia, the private and public sectors, international development organizations, and USAID/Serbia offices.

Rather than act as an authoritative source on the country's digital ecosystem, the DECA is intended to assess opportunities and challenges tailored to USAID's programmatic priorities.

FIGURE 1: The digital ecosystem



Section 2:

DECA findings

Serbia has been on a path toward digitalization for the last decade. With the arrival of Prime Minister Ana Brnabić in 2017, digitalization became a key priority for the Government of Serbia — particularly for public administration, education, and the economy. Serbia's participation in the Digital Agenda for the Western Balkans – a joint initiative of the six Western Balkans countries and the European Commission – further bolstered this prioritization. Through the Digital Agenda, the countries commit to invest in broadband connectivity; increase cybersecurity, trust, and digitalization of industry; strengthen the digital economy and society; and boost research and innovation. Serbia's government has released several high-profile digital strategy documents in recent years, including:

- Strategy for the Development of the Information Society in the Republic of Serbia to 2020
- Strategy for the Development of Electronic Communication in the Republic of Serbia from 2010 to 2020
- Strategy for the Development of Next Generation Networks (NGN) in the Republic of Serbia to 2023
- Strategy for the Development of the IT industry in the Republic of Serbia to 2020
- Strategy for the Development of Information Security 2017-2020

There have been promising advances in Serbia across several key DECA pillars. For example, digital connectivity infrastructure is well-developed and continues to improve, with plans to deploy 5G and build out fiber; digital divides (in most cases) are minor; digital government services are improving, as is digitalization among civil society organizations (CSOs) and media; and the ICT industry shows the strongest growth in the Western Balkans region. Nevertheless, there are still hurdles to clear before Serbia reaches EU standards. In many cases, barriers are similar for different parts of the digital ecosystem. For example, independent media organizations and tech startups, or micro, small, and medium enterprises (MSMEs) often lack the business acumen and funding to grow. In addition, government officials, business owners, entrepreneurs, and journalists sometimes lack the awareness and skills needed to fully benefit from digital technologies.

The digital divide explained

The digital divide is the distinction between those who have access and can use digital products and services and those who are excluded. There are often overlapping digital divides that stem from inequities in literacy, cost, social norms, or availability of relevant content. Digital divides may be associated with gender, economic status, geography, and age among other factors.

Over the past year, COVID-19 has illustrated the potential of the digital ecosystem in Serbia. From the government swiftly transitioning children to online learning to businesses moving toward e-commerce, Serbia is on an upward trajectory in its digital transformation with few signs of slowing down.

2.1. PILLAR 1: DIGITAL INFRASTRUCTURE AND ADOPTION

Digital Infrastructure and Adoption refers to the resources that make digital systems possible and how individuals and organizations access and use these resources. Digital infrastructure includes geographic network coverage, network performance, internet bandwidth, and spectrum allocation as well as telecom market dynamics around security, interoperability, and competitiveness. This pillar also examines behavioral, social, and physical barriers and opportunities for equitable adoption (like affordability and digital literacy[1]) — who uses digital technologies, how, and where.

INTRODUCTION

The legacy of communism and state ownership influenced the development of Serbia's digital connectivity infrastructure. Digital connectivity in Serbia is moderately competitive, with major private entities (such as Telenor, VIP Mobile, and Serbia Broadband) at the helm as well as government-owned Telekom Srbija, which significantly influences many parts of the connectivity infrastructure (see **FIGURE 2**).[2] In earlier years, Telkom Srbija had a fairly robust telephone network provided through copper wires; digital subscriber line (DSL) technology used these copper wires to deliver broadband service. Broadband piggybacked on another connectivity technology – cable lines installed for television. Most recently, fiber-to-the-premises infrastructure provided higher-quality connections to businesses and homes.[3]

Mobile infrastructure in Serbia improved over the past decade, with 4G mobile broadband covering more than 90 percent of the population and fiber-optic cables expanding throughout the country.[4] While Serbia is relatively advanced in terms of digital connectivity, competition-related challenges in terms of infrastructure sharing and last-mile service provision (where the internet reaches end users) remain. Despite these challenges, digital infrastructure in Serbia continues to evolve, with the government and the mobile network operators (MNOs) planning 5G deployment, expansion of fiber connectivity, and increasing adoption of emerging technologies such as AI and blockchain.

KEY TERMS: Spectrum, ISPs, and MNOs

Spectrum refers to different frequencies of electromagnetic radiation. Regulators designate specific frequency ranges (or *bands*) for different purposes, including telecommunications. Some bands (e.g., WiFi) are *unlicensed*, meaning that anyone can use them with the proper equipment. *Licensed* spectrum requires a regulator's approval to broadcast (e.g., cellular networks or FM radio). Licenses are typically allocated through spectrum auctions.

Internet Service Providers (ISPs) include both fixed-line and wireless technologies. Wireless ISPs operate over unlicensed spectrum. ISPs include both small, local services and global providers.

Mobile Network Operators (MNOs) provide cellular voice and data services. MNOs provide internet services through wireless technologies, operating over licensed spectrum. Many companies, such as Telekom Srbija, are both an ISP and an MNO, because they offer both fixed and mobile internet services

1 Digital literacy is the ability to access, manage, understand, integrate, communicate, evaluate, and create information safely and appropriately through digital devices and networked technologies for participation in economic, social, and political life. This may include competencies variously referred to as computer literacy, information and communication technology literacy, information literacy, and media literacy.

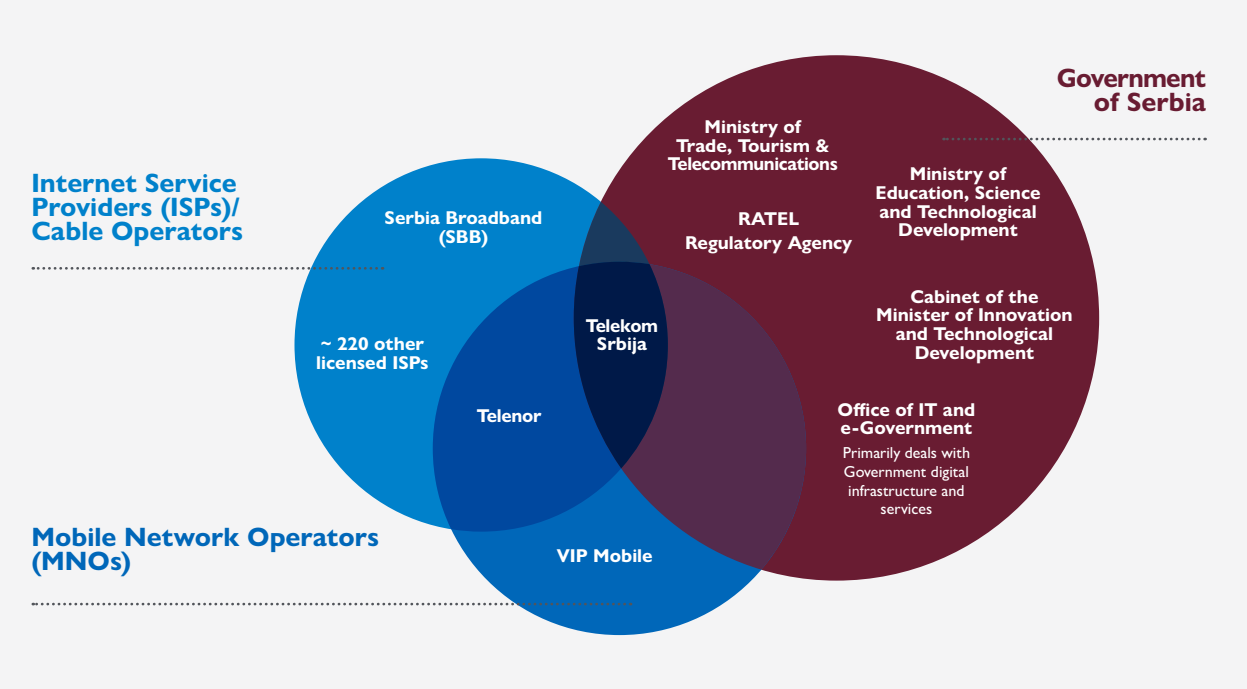
2 Telekom Srbija was spun off as a joint stock company and partially privatized in 1997, with the government buying back a majority of shares between 2003 and 2012.

3 Fiber-to-the-premises (FTTP) is a form of fiber-optic communication delivery in which an optical fiber is run directly onto customers' premises. Source: "Understanding Fiber to the Premises (FTTP)"

4 Implementation of digital infrastructure began with the adoption of the Law on Electronic Communications in 2010 using the EU 2003 regulatory framework for communications as its basis.

Access to and use of digital tools in Serbia is largely equitable across men and women. However, differences arise in participation in science, technology, engineering, and math (STEM)-related studies or professions, particularly due to social norms categorizing these areas as "male-oriented professions." Digital literacy is a key priority of the Serbian government, and impressive measures have been taken to ensure ongoing online education for children during the COVID-19 pandemic. Even so, additional steps such as education on cyber hygiene for children are needed to ensure a safe and inclusive online education system.

FIGURE 2: Key players in the Serbian digital infrastructure ecosystem



Notes: Based on desk research and conversations with key stakeholders.

A QUICK INTRODUCTION TO DIGITAL CONNECTIVITY

The term broadband commonly refers to high-speed internet access that is always on. Broadband can be *fixed* as well as *mobile*.

Broadband

Fixed

Fixed broadband provides a connection to an unmoving location and is cheaper to use than mobile broadband once installed.

Wireline

Cable modem

Cable modem service enables cable operators to provide broadband using the same coaxial cables that deliver pictures and sound to your TV set.

Digital Subscriber Line (DSL)

DSL transmits data over traditional copper telephone lines already installed to homes and businesses.

Fiber to the Home/ Office

Fiber-optic technology carries data using pulses of light through transparent glass fibers about the diameter of a human hair. Fiber transmits data much faster than DSL or cable modem speeds.

Wireless Broadband

Terrestrial (WiFi, TVWS, Microwave)

Wireless terrestrial broadband connects a home or business using technology such as radio links, microwave, or TV White Space. Access is often delivered from a network node to a high-gain antenna mounted on the exterior of the end-user premises.

Fixed Satellite

Fixed satellite uses a satellite dish to connect a ground-based gateway station via one or more communications satellites.

Mobile

Mobile broadband is typically delivered over a wireless mobile phone network (2G, 3G, 4G, 5G) and typically requires SIM cards to operate on mobile phones, tablets, or other devices.

Mobile Terrestrial

3G, 4G, and 5G are succeeding generations of mobile broadband network technology - a higher number reflects more advanced network capabilities with higher speed and capacity (more users and devices).

Mobile Satellite

Mobile satellite uses one or more communications satellites for use with mobile and portable wireless handsets.

Fixed

+ Pros

- Lower data costs
- Faster speed and greater reliability

− Cons

- Service tied to single location
- User must be in coverage area of access point

Mobile

+ Pros

- Portable – allows for user to roam freely
- Convenient
- Always connected

− Cons

- Requires phone number
- Reliability
- Bandwidth capacity constraints
- Higher data cost

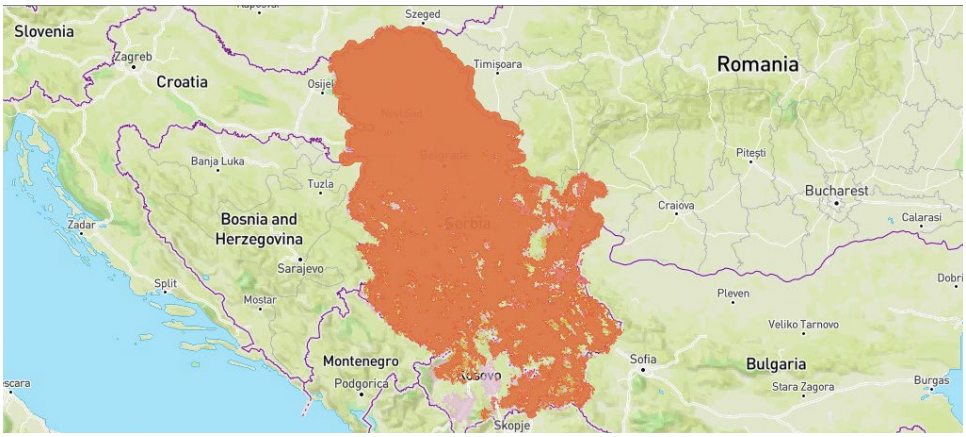
Sources:

Types of Broadband Connections, Federal Communications Commission (FCC)
What is the Difference Between Mobile Broadband and WiFi?, Rent n Connect
"Barriers to investing in last-mile connectivity," USAID

2.1.1. STRONG MOBILE BROADBAND CONNECTIVITY

Mobile broadband connectivity is strong in Serbia, with 3G covering almost 99 percent of the population and 4G covering more than 90 percent. In addition to strong 3G and 4G networks, the Government of Serbia and the top mobile network operators (MNOs) have made plans to roll-out 5G networks around the beginning of 2021 through spectrum allocation auctions (discussed in more detail in Section 2.1.3). Among MNOs, key companies include Telekom Srbija (a state-owned entity), Telenor, and VIP mobile.

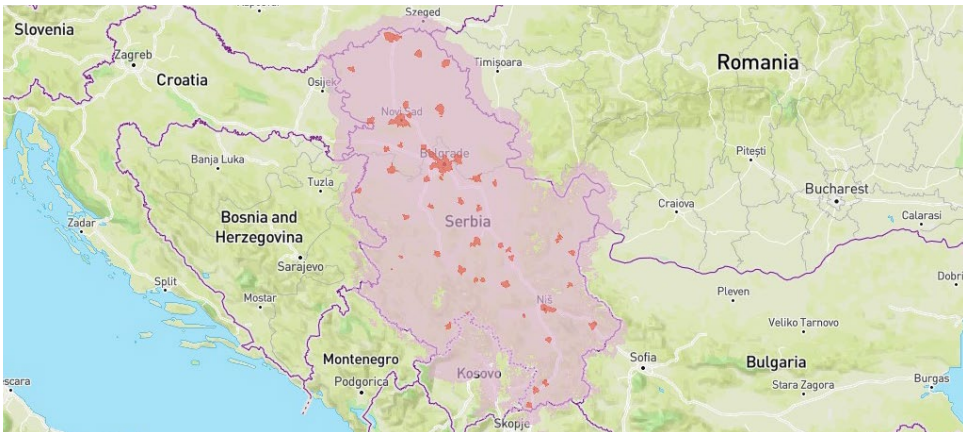
FIGURE 3: Geographic network coverage, Telekom Srbija and Telenor



Operator: mts (Telekom Srbija)

2G (GSM)
4G (LTE)

Source: GSMA



Operator: Telenor

2G (GSM)
4G (LTE)

Source: GSMA

FIGURE 3 shows geographic network coverage for Telekom Srbija and Telenor, with 2G (GSM) coverage shown in purple and 4G (LTE) coverage shown in orange. According to the data, 2G networks are available over most of Serbia's territory. Telekom Srbija claims to offer 4G coverage across most of the country, while Telenor's coverage is restricted to urban areas.

Despite strong mobile connectivity, the Serbian Government recognizes the need to expand and strengthen its digital infrastructure. The "Strategy for the Development of Next Generation Networks (NGN) in the Republic of Serbia to 2023" illustrates this recognition and promotes the use of cloud computing, the Internet of Things (IoT), and 5G connectivity.[5,6] The strategy also includes fiber broadband connectivity as an essential element of

5 See the International Telecommunication Union Telecommunication Standardization Sector's (ITU-T's) definition of Next Generation Networks.

6 Note that the Strategy document is only available in Serbian from the Official Gazette.

the future infrastructure to meet growing demands for bandwidth (including the increased backhaul necessary for 5G networks). Efforts to build out fiber broadband show that key stakeholders of digital infrastructure are aware of and attempting to establish digital connectivity in a way such that it can be efficiently and sustainably delivered up to the last-mile. Indeed, fixed broadband, especially fiber broadband, outperforms mobile broadband in terms of speed, data cost, and reliability.

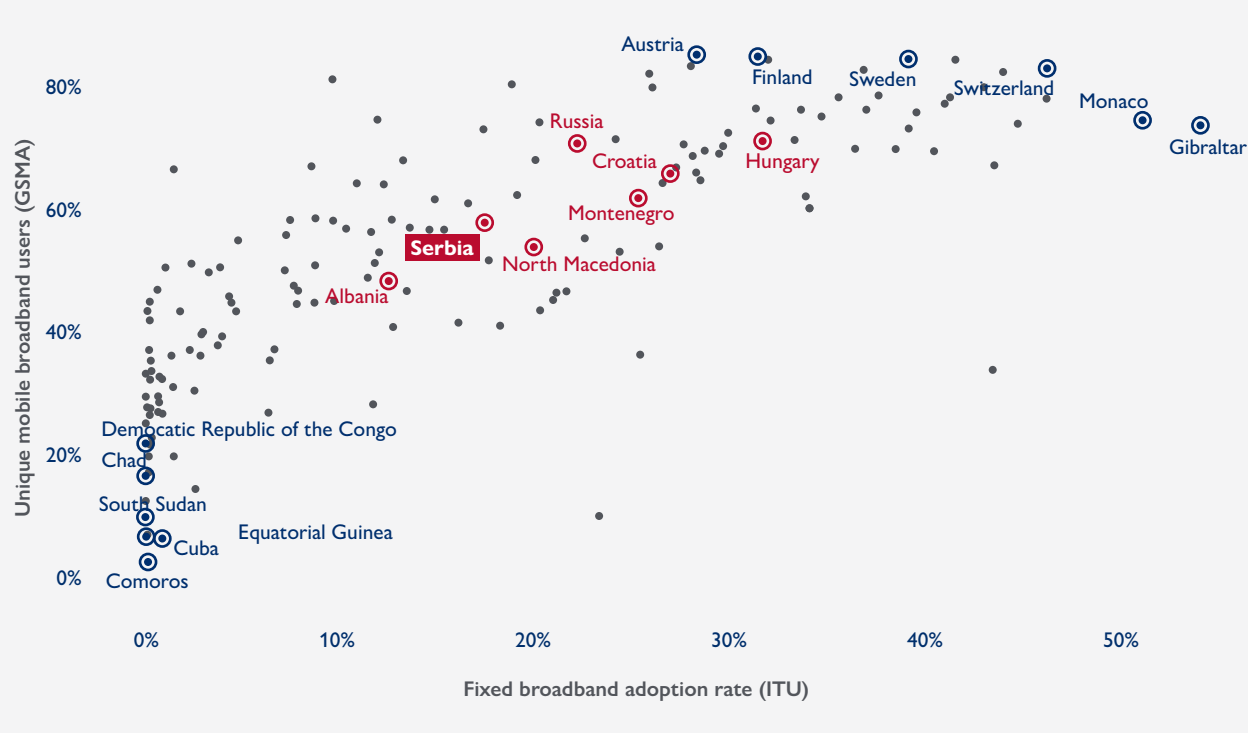
Serbia's well-developed mobile broadband network is a key enabler for digital media, online government services, and e-commerce. As in most countries, Serbia's 5G development (see Section 2.1.3) will likely take place on top of its existing 4G network. This means that some features of the current system – including limited competition in rural areas and a heavy reliance on Chinese-made network hardware – may be built into the networks of the future.

2.1.2. UNDERDEVELOPED FIXED-BROADBAND CONNECTIVITY

CURRENT STATE OF FIXED-BROADBAND CONNECTIVITY

Contrary to mobile broadband, fixed-broadband connectivity in Serbia will require further strengthening and expansion, with 18.5 percent of the population subscribing to fixed broadband. Regionally, Serbia lags behind most of its neighbors in terms of fixed-broadband adoption (indicated by the red countries in **FIGURE 4**). However, all the major cities and towns in Serbia are now part of the fiber transmission backbone.[7]

FIGURE 4: Adoption of fixed and mobile broadband

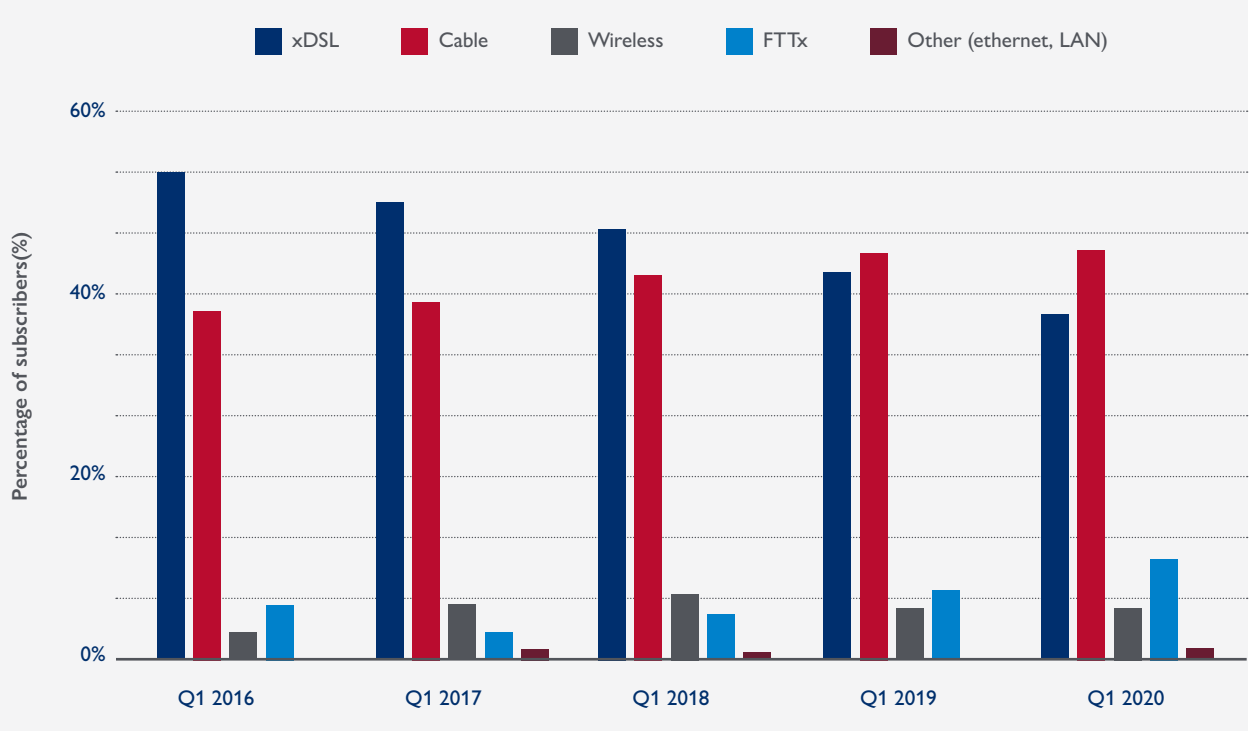


Source: GSMA Intelligence, ITU statistics

7 USAID Assessment: Internet Access Integrity in Eastern Europe, Serbia Country Assessment (2020).

Most homes in urban parts of Serbia access the internet via a cable connection. Cable services have rapidly overtaken DSL within the past few years; however, getting to a strong fiber-optic network may take some time, with only 10.8 percent of the total user base currently being connected to the fiber-optic network (see **FIGURE 5**). Serbia is prioritizing investment in fiber connections because they are faster than cable, have lower ongoing operational and maintenance costs, and can support more devices; however, it will take time to build the network.

FIGURE 5: Proportion of broadband subscribers by type

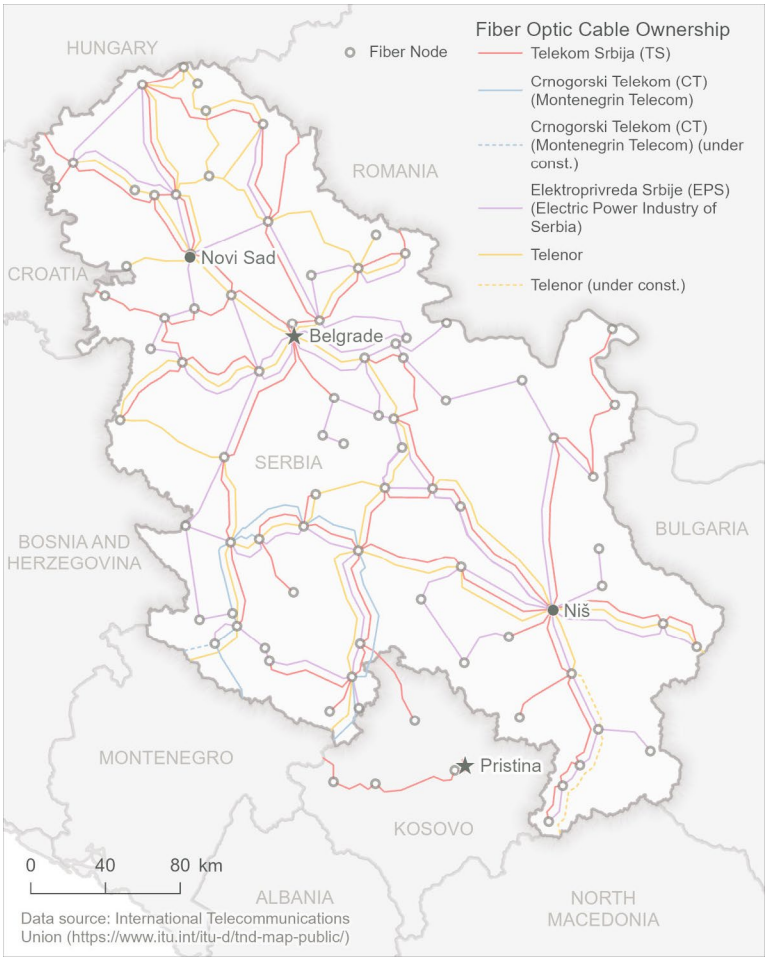


Source: RATEL Quarterly Reports (Q1 2016 – 2020)
Notes: FTTx stands for (Fiber To The X); "X" refers to the end-customer premises – home, office, school, and so on.

There are conflicting reports on how existing fiber infrastructure is being shared among larger ISPs. Public sector interviewees have claimed that although the government owns the fiber that is installed, it is meant to be shared by all major telecommunication service providers. In contrast, private sector providers have reported that access to fiber is a major problem for them. Telekom Srbija claims to have too little capacity to share fiber or ducts with other providers. Connectivity experts in Serbia claim that it is difficult to check whether this is true. Serbia lacks a database of fiber and duct infrastructure; this also makes it difficult to rent existing infrastructure or build out more. **FIGURE 6** shows Serbia's fiber-optic backbone network, color-coded by ownership. Telekom Srbija and Telenor both have networks reaching most of the country, along with a network that Elektroprivreda Srbije (the state-run power utility) built to support Serbia's electric infrastructure.[8]

8 See pg. 24 of RATEL's 2016 broadband strategy for background on the EPS network.

FIGURE 6: Serbia's fiber-optic backbone network



Ultimately, all stakeholders agree that fiber optics need to be built out into the middle- and last-mile to ensure greater capacity and efficiency in the digital infrastructure ecosystem.[9] The need for greater capacity will become particularly acute with the advent of 5G networks (see Section 2.1.3). Realizing the full benefits of 5G will require a fiber network that is robust enough to handle the demands of millions of connected devices. Deploying 5G without sufficient fiber backhaul is like attaching a high-power firehose to a garden spigot — one can retrieve water, but not at the needed volume.

NON-FUNCTIONING UNIVERSAL SERVICE

A Universal Service Fund (USF) is a mechanism in which telecommunications revenues are taxed in order to provide inclusive access to connectivity. USF funds often subsidize the cost of new projects, typically aimed at rural areas, schools, and hospitals.

In Serbia, the 2010 version of the Law on Electronic Communications includes a definition of Universal Service, but interviewees did not seem to know its implications for digital connectivity.[10] At the time of writing (April 2021), it is unclear exactly how USF will operate, in part because the Serbian telephone regulator (RATEL) has been waiting on an updated version of the Law on Electronic Communications from the Ministry of Trade,

9 The middle-mile is where the internet passes through a country and includes the national backbone and intercity network (such as fiber backbone, internet exchange points, and so on).

10 Article 55 of the Law on Electronic Communications "Official Gazette of RS". no. 44/10, 60/13 - US decision, 62/14 and 95/18.

Tourism, and Telecommunications (MTTT) and related by-laws that are expected to outline more details and a comprehensive definition about Universal Service obligations. Currently, there are no funds provided through USF, nor has RATEL chosen any specific telecoms provider to be the carrier of the Universal Service. Once defined, the Universal Service could potentially ensure connectivity for more people.

2.1.3. EXPANDING DIGITAL INFRASTRUCTURE

INCREASING FIBER CONNECTIVITY

The Western Balkan Investment Framework (WBIF) "supports socio-economic development and EU accession across the Western Balkans through the provision of finance and technical assistance for strategic investments." The project is a joint initiative of the EU, financial institutions, bilateral donors, and the governments of the Western Balkans. WBIF funds projects in energy, environment, social development, transport, and digital infrastructure.

In Serbia, the Rural Broadband Rollout project is beginning to expand rural access with WBIF support. The project will support the deployment of middle-mile fiber broadband to the existing fiber backbone. It is not currently profitable for any single operator to deploy broadband in disconnected "white zones" due to geographic isolation and low population density. The primary goal is to connect around 1,500 schools in rural white zones. It will also cover about 225,000 households with next-generation connectivity. Through this project, the Ministry of Trade, Tourism, and Telecommunications (MTTT) aims to promote competitiveness by building a bridge to last-mile customers.

THE ARRIVAL OF FIFTH-GENERATION MOBILE NETWORKS (5G)

In 2019, Telenor launched Serbia's first 5G base station in Science Technology Park Belgrade. Telenor's initial deployment was a test environment for students and professionals to use while working in the Park. 5G spectrum allocation auctions were planned for 2020 but postponed to the end of 2021 due to COVID-19.

Many interviewees were skeptical about whether 5G will be implemented on schedule. RATEL is reportedly waiting on a minimum by-law to evaluate the commercial viability of 5G.[11] The by-law is a Rulebook on the Minimum Requirements for the Issuance of Individual Licenses for Radio Frequency (issued by the MTTT). RATEL anticipates that the by-law will cover the frequency bands to be auctioned, the number of individual licenses for each band, the number of generic blocks for each individual band, and spectrum reservation.[12] Some experts foresee further delays due to the recent Serbia-Kosovo Economic Normalization Agreement with Washington, which includes language around prohibiting 5G equipment from "untrusted vendors". Serbian and U.S. officials seem to disagree on the exact interpretation of this language.

Businesses' adoption of 5G could relieve pressure on Serbia's 4G networks, freeing up bandwidth for consumers. Initial 5G use cases will likely focus on industrial-level services. Benefits of 5G include faster connections, streaming, and downloads. This advancement in turn can support emerging technologies such as augmented reality and virtual reality. Extensive misinformation surrounds 5G (see more in Section 2.2.3). 5G may not be profitable without a mass consumer market, and Serbia's market is currently not strong enough to absorb the

11 A minimum by-law is the minimum set of rules or laws that an organization or community establishes to regulate itself, as some higher authority allows or provides. The higher authority is generally a legislature or some other government body and establishes the degree of control that the by-laws may exercise.

12 Additional issues include: the possibility for introduction of local or new operators, the minimum fee for the issuance of individual licenses, coverage obligations, license durations, spectrum caps, frequency trading, different pricing for different frequency blocks, and start of frequency usage.

initial costs of rollout. This will likely lead to slow, segmented 5G deployment. Most of Serbia's private sector and civil society have limited awareness of 5G; the government and telecom companies have the strongest interest. Experts suggest that MNOs and the government should also consider the implications of 5G creating a larger digital divide. High-bandwidth, short-range connections are only viable in dense urban areas, meaning that rural populations will be largely left out.

CHINESE INFLUENCE IN BUILDING CRITICAL DIGITAL INFRASTRUCTURE

Chinese investment through the Digital Silk Road (DSR) is influencing Serbia's digital ecosystem development. DSR is the 'digital' side of China's Belt and Road Initiative and has four components:

i.) *investing in digital infrastructure abroad*, including next-generation cellular networks, fiber-optic cables, and data centers;

ii.) a domestic focus (i.e., within China) on *developing advanced technologies that will be necessary for global economic and military power*, including satellite-navigation systems, artificial intelligence, and quantum computing;

iii.) *promoting e-commerce through digital free-trade zones*, which can increase international e-commerce by reducing cross-border trade barriers and establishing regional logistics centers; and

iv.) *establishing an ideal international digital environment* (for China) through digital diplomacy and multilateral governance.

The first point aligns with the Serbian government's interest in connectivity expansion. Most of the major Western telecommunications providers (such as Nokia, Ericsson, Cisco, Siemens, and Juniper) are present in Serbia. However, the Chinese firm Huawei stands out as a significant contractor, supplier, and advisor. A recent MTTT press release highlights a close partnership with Huawei in the context of a "Memorandum of Development of Information Silk Road." While it is unclear whether Huawei will be the primary supplier of 5G infrastructure, it is close to key players in Serbia's digital ecosystem. In 2019, state-owned Telekom Srbija worked with Huawei on a 150 million EUR (177.48 million USD) project to establish high-speed broadband internet. Huawei supported the government data storage center in the city of Kragujevac by providing cloud infrastructure and developing an AI platform. They reportedly supplied Serbia's Ministry of Internal Affairs with 1,000 digital surveillance cameras (with license-plate scanning and facial recognition capabilities) to further a "Safe City" initiative. This project has been controversial within Serbia, and there is reportedly no publicly available information about it. In 2019, the Government of Serbia also signed a memorandum of understanding (MOU) with Huawei Technologies to establish Smart Cities projects in Belgrade, Novi Sad, and Niš. In Belgrade, Huawei has opened the Huawei Innovation and Digital Transformation Center, envisioning it as a regional hub for the Western Balkans.[13]

2.1.4. ACCESS AND USE OF DIGITAL TOOLS AND SERVICES

RELATIVE DIGITAL EQUITY

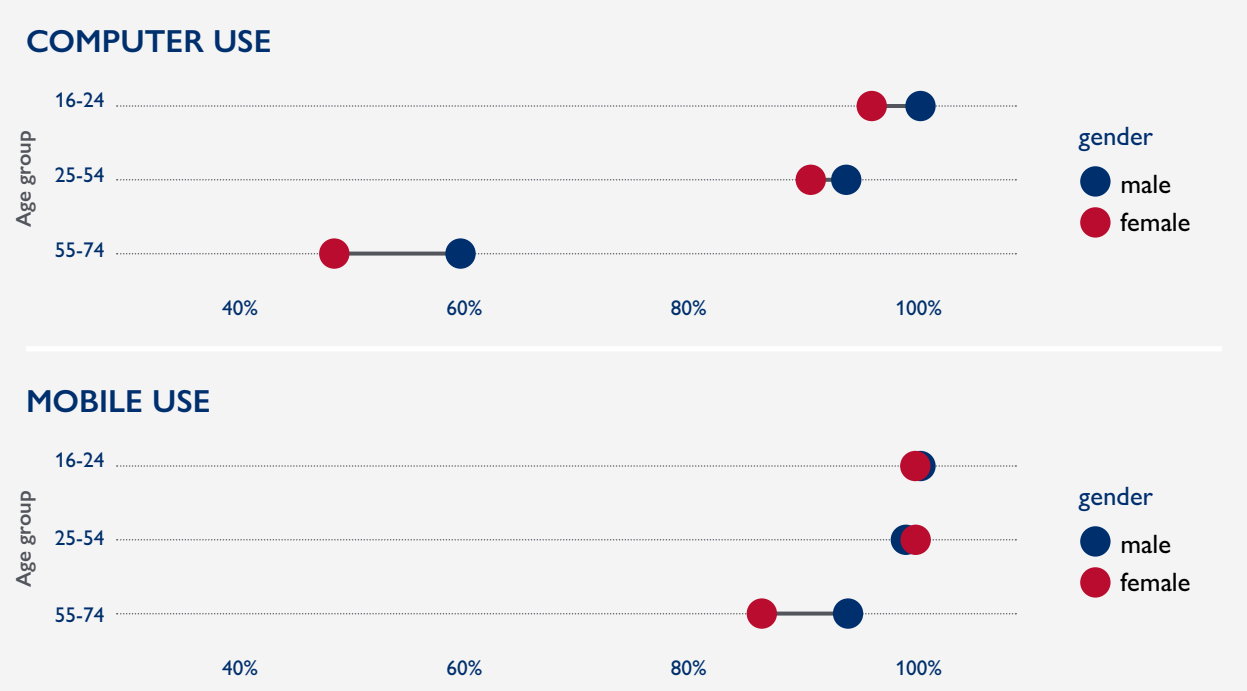
There are few significant digital divides in Serbia. Although there are some differences between income groups and urban-rural settings, gender digital divides in access and use of digital tools and services are negligible (see

13 USAID Assessment: Internet Access Integrity in Eastern Europe, Serbia Country Assessment (2020).

FIGURE 7), especially for younger people (<24).[14] The only pronounced gender gap appears among older people (>55); however, this gap is far smaller than the age-related access gap.

According to interviewees, the more persistent gender digital divides are tied to social norms about STEM professions being male oriented (see **BOX 1**). Nevertheless, things are changing rapidly. Between 2011 and 2019, Serbia saw the highest rates of average annual growth of female ICT specialists among both EU and non-EU countries (13 percent for Serbia compared to 4.9 percent on average for the EU).[15]

FIGURE 7: Mobile and computer use, disaggregated by age and gender



Source: Usage of Information and Communication Technologies in the Republic of Serbia, Statistical Office of the Republic of Serbia (2020)
Note: The only statistically significant gender differences were in computer and mobile use for the 55-74 age group.

BOX 1: Inclusion of women in the digital sector

In discussing digital adoption, it is important to understand opportunities and barriers for different population segments. Women, youth, and marginalized groups (such as Roma communities) are often affected disproportionately due to a range of factors including social norms, comparatively lower income, and lower digital literacy rates.

Serbia performs quite well in terms of gender equality in the adoption of digital tools and services, but gaps exist in women and girls' inclusion in the ICT field. [16] In 2019, only 21.6 percent of employed ICT specialists in Serbia were women (this figure is slightly better than the EU average of 17.9 percent).[17] This lack of gender parity in ICT sector employment correlates with social norms around ICT being a male-centric profession. For school-aged girls, the lack of

14 Internet use increases as households have more income (59 percent for up to 300 euros, and 98 percent with 600 euros and more), or are based in urban areas of Serbia (70 percent rural, 87 percent urban). As of 2020, almost 94 percent of households had access to a mobile phone, about 5 percent had a laptop, and almost 98 percent had a TV set. "Usage of Information and Communication Technologies in the Republic of Serbia, Statistical Office of the Republic of Serbia (2020)".

15 For male ICT specialists during the same period, average annual growth was 8.9 percent for Serbia, and 4.2 percent on average for the EU.

16 Mobile phone use is equal, at 100 percent, among youth aged 16-24; 98.7 percent of women aged 25-54 use mobile phones compared to 97.1 percent of men; 84 percent of women aged 55-74 use mobile phones compared to 87 percent of men. Source: "Инфраструктура," Република Србија, September 6, 2018.

17 Gendered differences in ICT employment are not unique to Serbia and are a universal issue.

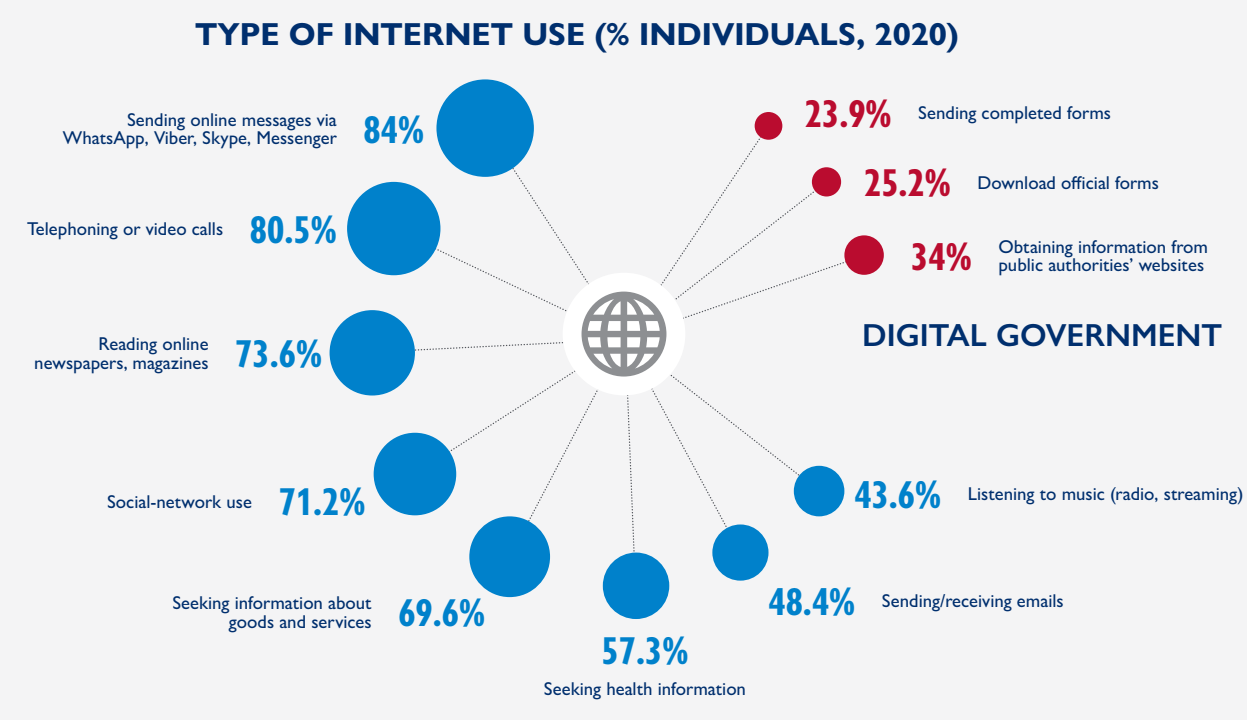
female role models in high-level ICT/STEM careers continues the cycle of women entering 'feminine' fields — mostly in the service sector or self-employment. Even when women enter ICT organizations, they are mostly moved into public relations and other non-technical roles. In many cases, the burdens of housework and childcare deter women from staying in a professional field.

Harnessing the potential of both girls and boys who are interested in STEM can benefit an entire economy. Forecasts show that closing the gender gap in STEM could contribute to an increase in EU gross domestic product (GDP) per capita by 2.2 to 3 percent by 2050.

A BRIEF OVERVIEW OF THE USE OF DIGITAL TOOLS AND SERVICES ACROSS SECTORS

In general, most Serbians use the internet more for social purposes than for digital government services or seeking health advice. While online government services have improved, inefficient platforms and low digital literacy hamper their use (see Section 2.2.2). On the business side, COVID-19 has shown that people are more likely to frequent and to buy from e-commerce sites, but supply-side barriers remain (see Section 2.3.4).

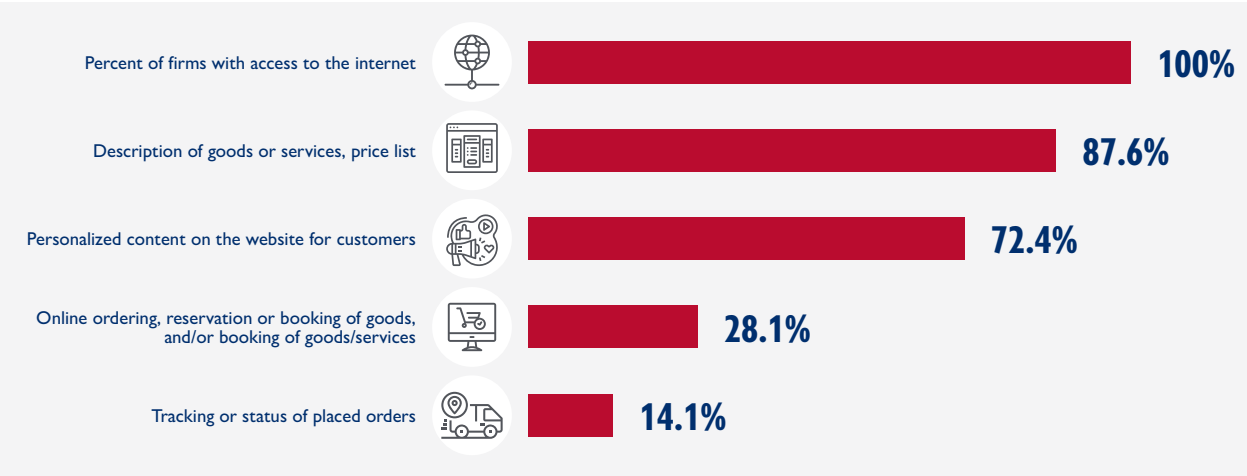
FIGURE 8: What do Serbians use the internet for?



Source: Usage of Information and Communication Technologies in the Republic of Serbia, Statistical Office of the Republic of Serbia (2020)
Note: 'Seeking health information" is likely related to using search engines for seeking health information, more so than using formal digital health platforms.

Among enterprises, there is a lot of untapped potential in using digital platforms and services to help with their growth and efficiency. Although 100 percent of the firms surveyed have access to the internet, SMEs lack the capacity to take online orders or track the status of orders placed, despite many of them having websites. Interviewees attributed this inability to a lack of knowledge around how to employ digital resources (see Section 2.3.4, supply side challenges). Of course, the COVID-19 pandemic is changing the way businesses use ICT and how individuals view e-commerce, which will likely continue to improve.

FIGURE 9: Firms' use of digital platforms



Source: Usage of Information and Communication Technologies in the Republic of Serbia, Statistical Office of the Republic of Serbia (2020)

THE POTENTIAL AND RISKS OF EMERGING TECHNOLOGY

Emerging technology encompasses a range of technologies, such as AI, the Internet of Things (IoT), and blockchain. These technologies can bring a range of benefits, including digital experiences that are more user-friendly, and help overcome barriers of disability or language. Emerging technology also brings new risks, such as "deepfakes," realistic falsified images, audio, and video that can be used for disinformation or online gender-based violence.

In Serbia, some telecommunications organizations, banks, and retail markets already use AI. Telecom companies in Serbia have been using AI and machine learning (ML) to improve back-end processes, while banks and the retail sector have been trying to implement AI in customer service, such as through intelligent chatbots. Aside from the private sector, the Government of Serbia also recently developed a *Strategy for the Development of Artificial Intelligence in the Republic of Serbia for the period 2020-2025* and identifies AI as a key contributor to the development of economic growth, digitalization, and education. The Strategy also recognizes the risks that AI can bring, including data protection, transparency, and changing the types of jobs that are in demand, which will require changes to the education system.

2.1.5. DIGITAL LITERACY: A CRITICAL ENABLER OR BARRIER IN FURTHERING TECHNOLOGICAL PROWESS

USAID defines digital literacy as the ability to access, manage, understand, integrate, communicate, evaluate, and create information safely and appropriately through digital devices and networked technologies for participation in economic, social, and political life. Digital literacy involves a variety of skills, summarized in the EU's DigComp 2.0 framework (see **TABLE 1**). USAID's Digital Strategy emphasizes the importance of digital literacy in helping to extend the benefits of digital transformation to everyone, including the vulnerable and marginalized.

TABLE 1: EU DigComp 2.0 competence areas and competences

COMPETENCE AREA	COMPETENCES
1. Information and data literacy	1.1 Browsing, searching and filtering data, information and digital content
	1.2 Evaluating data, information and digital content
	1.3 Managing data, information and digital content
2 Communication and collaboration	2.1 Interacting through digital technologies
	2.2 Sharing through digital technologies
	2.3 Engaging in citizenship through digital technologies
	2.4 Collaborating through digital technologies
	2.5 Netiquette
	2.6 Managing digital identity
3. Digital content creation	3.1 Developing digital content
	3.2 Integrating and re-elaborating digital content
	3.3 Copyright and licenses
	3.4 Programming
4. Safety	4.1 Protecting devices
	4.2 Protecting personal data and privacy
	4.3 Protecting health and well-being
	4.4 Protecting the environment
5. Problem solving	5.1 Solving technical problems
	5.2 Identifying needs and technological responses
	5.3 Creatively using digital technologies
	5.4 Identifying digital competence gaps

Source : The Digital Competence Framework 2.0, European Commission

The onset of COVID-19 in 2019/2020 and social distancing has demonstrated the need for people to hone their digital literacy skills — be it for work, for school, for accessing government services, for health, or for keeping their businesses running. While the shift to digital has not been difficult for many young, urban Serbians, differences become stark for children, for older adults, for those who have limited access to digital tools, and for those with limited digital literacy skills. An interviewee noted that "there is a changing definition of digital literacy — it's no longer just about being able to use Microsoft Office or send an email, it's more about a digital-by-default mindset."

Across all stakeholders in the digital ecosystem, there is consensus that digital capacity building needs to grow among children as well as adults. "Developing a culture and knowledge based on digital literacy" was identified as one of six challenges in a 2019 voluntary national review of Serbia on the implementation of the 2030 agenda for Sustainable Development Goals (SDGs). Digital literacy may range from teaching basic digital skills, such as using a device to access the internet and create content, to more advanced topics around cybersecurity, cyber hygiene, and data management — consistent with a range of competencies associated with digital literacy.[18],[19]

DIGITAL LITERACY FOR SCHOOL-AGED CHILDREN AND COVID-19 PUSH TO ONLINE PLATFORMS

With the Government of Serbia's increasing move toward digital transformation, the government has worked to incorporate digital literacy skills such as coding into primary and secondary school curricula with support from organizations such as the Petlja Foundation and Digital Serbia Initiative. [20]

Early in the COVID-19 crisis, the Serbian government took measures to promote access to distance learning for school-aged children through TV and online platforms that resulted in 98 percent of school children using distance learning.

The use of television for distance learning has been successful. Other online initiatives have mixed results and surface several issues that need to be addressed to ensure a safe and inclusive learning environment for children:

i.) **Child safety online:** On average, Serbian children spend more than 3 hours per day online. About 40 percent of Serbian children speak with strangers online.[21] Part of ensuring that children stay safe online includes cyber hygiene – how to protect yourself and your data online – which is not currently built into the standard ICT curricula at schools.[22] However, a multi-stakeholder initiative launched in 2019 created curricula intended for use in schools and preschools.[23] This resource highlights key themes that parents and teachers may need to understand, such as digital device settings for safe internet use, or how internet predators may work. For children, there are cartoons and leaflets explaining good cyber practices and what it means to protect one's data on the internet.

ii.) **Poor and vulnerable families:** Children whose caregivers are unemployed, or recipients of welfare services are more likely than the average respondent to lack access to distance learning (or not use it).[24] Interviewees reported that homework was still meant to be submitted via internet-driven applications such as Viber or Google Drive. For many families with limited access to digital devices, online schooling

18 Cyber hygiene is the ability to stay safe and secure online through routine practices. Good cyber hygiene includes changing passwords regularly, keeping personally identifiable information (PII) private, backing up data, and updating hardware/software often. See Appendix A for universal definition.

19 See DigComp 2.0 for key areas of digital literacy and relevant competencies.

20 At the time of writing this report, the Government of Serbia mandated coding into their curricula from Grades 3 to 6 in elementary school (curricula are changing this year, pushing coding at the lower grades).

21 Children between the ages of 9 and 17.

22 A blog by EdTech lays out the different kinds of cyber hygiene education by grade level. For elementary school students, it's mostly about understanding that the digital world is connected to the real world in which they live; for older students in middle and high schools, children can be taught about privacy, ethical dilemmas, and the digital footprint;

23 The 'Children and the Net - Smart from the Beginning' digital guide was produced within the Family Safety Net project, launched by UNICEF and Telenor Company, and implemented by the Serbian Ministry of Education, Science and Technological Development and the Užice Child Rights Centre non-governmental organization (NGO).

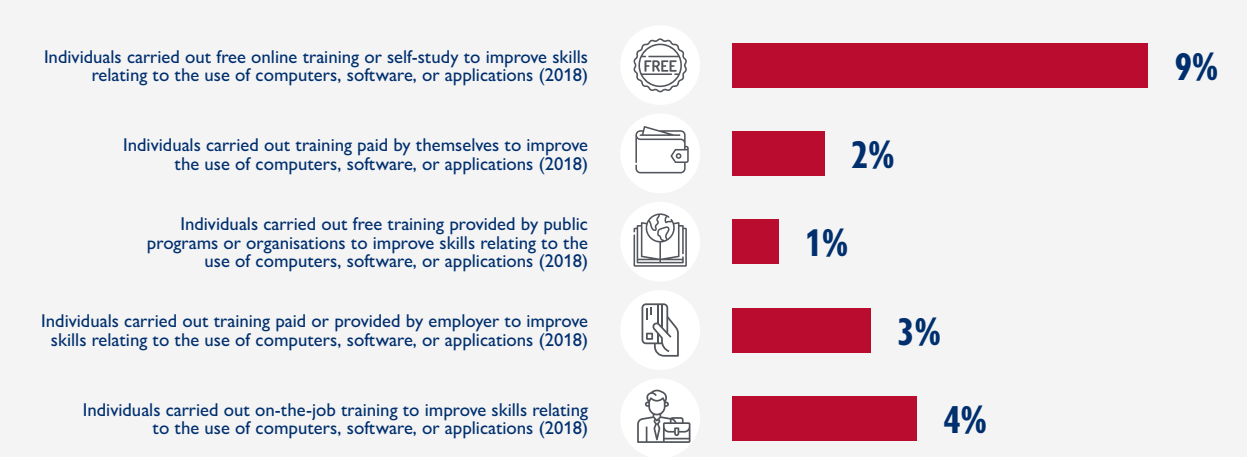
24 Almost 3 percent

may aggravate existing educational barriers and widen the digital divide.[25] Going online is particularly difficult for vulnerable groups such as Roma children, and there were concerns that this requirement is disproportionately causing children in these communities (especially young girls) to drop out.[26] Of the 2 percent of children who could not use online-learning platforms, 25 percent were Roma children, 20 percent were children with disabilities, and approximately 13 percent were from other vulnerable groups. Some of the primary reasons included language barriers for both children and their parents, lack of internet access, and the unavailability of appropriate devices.

DIGITAL LITERACY FOR TERTIARY EDUCATION AND CAREER-BUILDING

Aside from introducing digital literacy from an early age, it is important to continue to harness these skills at a tertiary education level, regardless of whether the goal is to pursue a STEM career. Serbian universities lack well-equipped research labs, making it difficult to acquire relevant ICT skills. It is more common for Serbians to build ICT skills through jobs, innovation hubs, or online courses (see **FIGURE 10**). With the increasing availability and use of e-commerce platforms, it is also essential for universities and relevant organizers to promote career-related specialized skills, such as supply-chain management for digital platforms (see **BOX 9**, Section 2.3.4).

FIGURE 10: Way of obtaining ICT skills



Source: Eurostat

Notes: Percentages represent the percentage of individuals responding "yes" to each category

25 According to the aforementioned UNICEF survey, due to COVID-19, 14 percent of households reduced their monthly spending on electricity due to income reductions of 10 percent or more. Surveyed households also reduced the amount of time children spend in front of a tv/computer by 23 percent.

26 Indeed, 17 percent of Roma children and 4 percent of students with disabilities did not attend any elementary school classes. The exclusion of vulnerable groups from secondary schools was somewhat smaller – 9 percent and 3 percent of Roma children and students with disabilities did not any secondary classes, respectively. Source: "COVID-19 Socio-Economic Impact Assessment".

2.2. PILLAR 2: DIGITAL SOCIETY, RIGHTS, AND GOVERNANCE

Digital Society, Rights, and Governance focuses on how digital technology intersects with government, civil society, and the media. This pillar is divided into three sub-sections: Internet Freedom; Civil Society and Media; and Digital Government. Internet Freedom explores factors that enable or constrain the exercise of human rights and fundamental freedoms online. This includes individual rights to freedom of speech, privacy, and free assembly, and the abuse of these rights through digital repression. Civil Society and Media identifies key institutions and how they report on, advocate around, and influence online freedoms. Digital Government looks at the government's efforts to manage internal IT processes and systems, deliver citizen- and business-facing e-services, and engage with the public through digital channels.

INTRODUCTION

Serbia is undergoing "digitalization," a digital transformation of its institutions. In contrast to digitization – the conversion of documents into an electronic format – digitalization denotes a more profound shift in work processes and organizational culture. Such sweeping changes are never easy. Serbia's experience reveals some common obstacles, including bureaucratic inertia and entrenched institutional mindsets, including misaligned incentives, bureaucratic inertia, and entrenched interests. New information technology (IT) systems often outpace the political work of building trust and cultivating a shared vision.

2.2.1. SERBIA'S DIGITALIZATION AGENDA

With Prime Minister (PM) Ana Brnabić's arrival in 2017, digital transformation became a key government priority. As one government interviewee recalled, "people didn't even know how to pronounce the word digitalization, but now people call the PM's office and complain when they have to fill out a paper form."

Brnabić has taken various steps to realize her digital vision. In 2017, the Office of IT and e-Government (OITeG) was formed under the PM's Office. OITeG's mission is to harmonize digital transformation efforts across the government. In late 2019, a government data exchange system was launched with donor support. Serbia's first government-wide data center was established in 2017 in Belgrade.[27] In December 2020, a second state data center officially opened in Kragujevac; private businesses were invited to rent excess capacity at the center. IBM was the first to sign an agreement, followed shortly by Huawei.

Some interviewees (especially in civil society) felt that the lack of a unifying digital government strategy impedes progress. The pace of progress varies across ministries, leading to siloed systems and limited gains from increased digital adoption.

DIGITAL GOVERNMENT SERVICES

Most digital government services are accessible through OITeG's website, which provides a one-stop landing page called the eUprava portal (*uprava* translates to "administration"). The portal offers about 800 electronic services connected to various ministries and levels of government. Services include business registration, building permits, vehicle registration, school registration (eKindergarten), and birth registration (eBaby).[28] eUprava also houses a health information system (ePrescription) that enables electronic prescription processing at more than

27 A government data center is a facility that centralizes its shared IT operations and equipment for the purposes of storing, processing, and disseminating data and applications. These are located away from the government's physical premises and are accessible through the internet.

28 A web application that allows for registration of births and processing of related administrative activities, including residence registration, health insurance registration, and parental allowances/subsidies.

163 healthcare institutions and 3,600 pharmacies, and a system for electronic payment and filing of personal and business taxes. While the wide range of services offered on eUprava demonstrates the government's concerted digitalization efforts, gaps in accessibility and interoperability remain. eUprava is becoming increasingly integrated with Serbia's national ID system. The government has optimized only some citizen-facing portals for mobile devices.

Serbia has fairly advanced infrastructure for digital signatures, but adoption is not yet widespread. Digital signatures became available in 2009 with the Electronic Signature Law, which introduced card readers and two-factor authentication. Digital signatures are typically linked to bank accounts, passports, and ID cards; they are primarily used for business, commerce, and banking purposes. An interviewee claimed that he was able to register an LLC online in one day using digital signatures. This would have been unimaginable even two years prior. Individual citizens can use digital signatures for government services, including those involving digital health and digital payments.

In 2017, the Electronic Document, Electronic Identification and Trust Services in Electronic Business Law superseded the Electronic Signature Law. The new law created a hierarchy of signatures, introduced a digital seal, and set up an electronic document exchange. This advanced infrastructure allows government ministries to exchange documents and contracts electronically. A lack of trust among government officials and citizens seems to limit broader adoption of digital signature tools – as one interviewee said, "Serbia very much likes paper and stamps."

BOX 2: Electronic registration reforms the gray economy for seasonal and informal workers

The gray economy refers to economic activity that is unofficial, unregulated, and missing from official statistics. Digital applications can help the government regulate, collect taxes, and provide benefits to workers in this informal sector.

In 2019 the *Deutsche Gesellschaft für Internationale Zusammenarbeit* (GIZ), in partnership with the National Alliance for Local Economic Development (NALED), created an electronic platform to register seasonal employees who work in the agriculture, forestry, and fishery sectors.[29] Within the first 18 months, a total of 37,597 seasonal workers (47 percent of the estimated total) were legally registered using simplified digital registration procedures. Registered users paid a total of 400 million dinars (3.4 million EUR) in taxes and contributions.

Mobile applications allow informal workers to register their skills so that employers can choose help based on skills that do not come up during interviews. User-friendly applications can be accessed via mobile phones. Contact centers support workers with personnel who guide them through the registration process.

The most important thing for the workers was that they did not want to lose access to public social benefit programs. Currently, once employees are registered (even for a temporary hire), they are immediately removed from the social benefits system. This arrangement highlights how a gray economy cannot be "fixed" by technology alone; lasting change requires both technology and policy interventions.

29 The National Alliance for Local Economic Development is one of the largest private-public business associations in Serbia.

STRUGGLING WITH DIGITALIZATION

The current government approach to digitalization is gradual, with a growing collection of strategy documents and varying capacity to implement across ministries.[30]

OITeG has a mandate to expand ICT use in Serbia and digitalize public-sector services.[31] OITeG cannot compel ministries to digitalize, but encouragement from OITeG carries weight and has nudged some ministries toward action. Local governments, which focus more on infrastructure, lag behind the central government in digitalization efforts.

The Serbian National Interoperability Framework, adopted in January 2014, aims to modernize public administration. It considers interoperability to be key to the development of an information society. An *interoperable* system is one that enables the exchange of data, information, and knowledge through harmonized business processes with ICT support. Interoperability involves two components: human behavior and technology. The interoperability framework aims to ensure that interacting government systems protect citizen safety through adherence to regulations on privacy and personal data protection. A key piece of Serbia's interoperability approach is the Government Services Bus (GSB) – a shared communication channel that connects 23 government databases and allows secure information exchange.[32] OITeG established the GSB in late 2019 with support from the World Bank's Enabling Digital Governance project.

While the GSB provides interoperable infrastructure, data-sharing remains a major point of friction. Some ministries are reluctant to migrate their data to the state data center. As a result, data is often siloed in ministry-specific "data islands" and a lack of interoperability of internal systems in some ministries is a challenge. The Ministry of Internal Affairs (MoIA), responsible for local and national police services, reportedly declined to join the centralized government network. It has its own internet infrastructure, including fiber, antennas, and dedicated ICT staff. One interviewee called the MoIA the "NASA of Serbia," referring to their advanced technical capacity. The Statistical Office of the Republic of Serbia aligns with EU standards and is generally well-regarded, but it is not integrated with other ministries in terms of data, information systems, and digitalized processes.

Personnel factors also affect the government's pace of digital transformation. Interviewees claimed that some senior government officials may be uncomfortable with changes in technology. Another challenge is retention of lower-level, younger, more digitally literate staff. Interviewees noted that these digitally savvy personnel tend to leave government jobs for the higher salaries in the private sector.

CATCHING UP ON CYBERSECURITY

A newly implemented Cybercrime Strategy, which aims to form anti-cybercrime units within agencies and the military, provides evidence that cybersecurity is a growing government priority. However, there often seems to be a mismatch between policy and implementation. For instance, OITeG has a cybersecurity department that is reportedly understaffed due to scarcity of qualified technical staff.

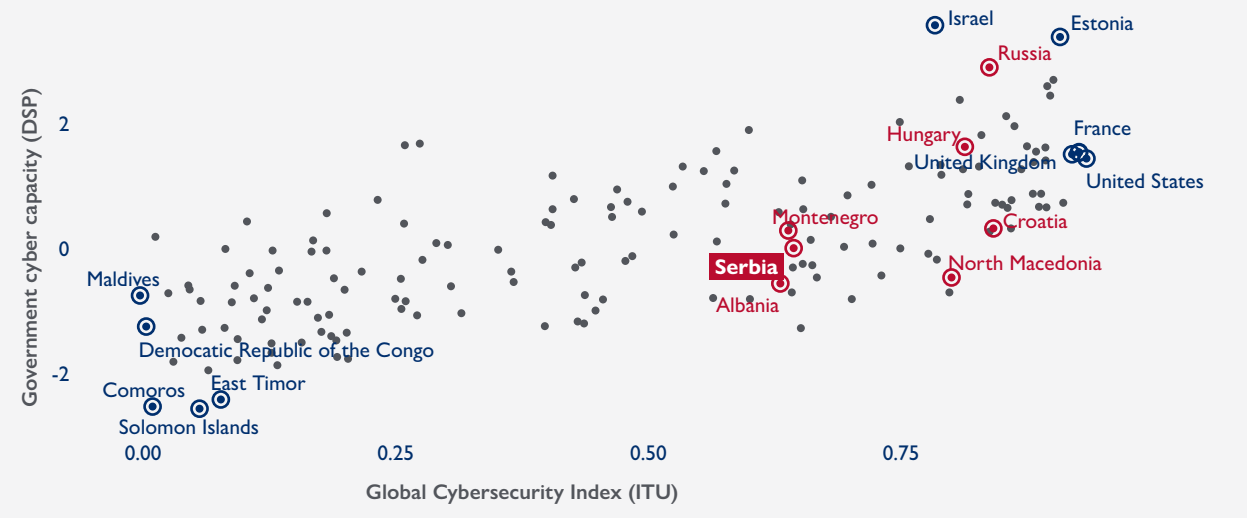
30 This collection includes: Including Strategy for the Development of eGovernment for the period 2015-2018; Strategy for the Development of the Information Society in the Republic of Serbia to 2020; Strategy for the Development of Electronic Communication in the Republic of Serbia from 2010 to 2020; Strategy for the Development of the IT industry in the Republic of Serbia to 2020; Strategy for the Development of Next Generation Networks (NGN) in the Republic of Serbia to 2023; and Strategy for the Development of Artificial Intelligence in the Republic of Serbia for the period 2020-2025. Most strategies can be found here.

31 Enabling Digital Governance in Serbia (Project Appraisal); Enabling Digital Governance in Serbia (Project Information)

32 The term "bus" (short for "omnibus") comes from the computer hardware field and originally referred to a bundle of parallel wires that connect key components, including the central processing unit, memory, and peripherals. Today, any shared communication channel that allows different components to share information might be referred to as a "bus."

Views on Serbia's cyber capacity vary. According to a 2019 World Bank Review, Serbia performs well across many dimensions of cybersecurity capacity and demonstrates a strong understanding of gaps and opportunities.[33] Nevertheless, Serbia lags behind its regional counterparts on the ITU's Global Cybersecurity Index, which rates government commitment to cybersecurity by legal, technical, and organizational measures. Similarly, the Digital Society Project (DSP) used a combination of country-expert ratings to place Serbia's cybersecurity capacity close to the global average, but among the lowest in Europe. [34],[35]

FIGURE 11: Serbia's cybersecurity standing in a global context



Source: Digital Society Project; ITU statistics

Serbia has taken a multi-stakeholder approach to cybersecurity policy development. Civil Society Organizations (CSOs) and the private sector, including major telecom providers, participated in policy dialogues and helped draft cybersecurity laws. The drafting process for the Strategy for the Development of Information Security 2017-2020 (SDIS) involved multi-stakeholder consultation, comment, and observation. The SDIS highlights five priority areas: (1) security of information and communication systems; (2) information security of citizens; (3) the fight against cybercrime; (4) information security of the country; and (5) international cooperation.

Serbia's National Computer Emergency Response Team (SRB-CERT) is a member of the International Forum of Incident and Response Security Teams (FIRST). It was established in 2017, accredited in 2019, and is housed under the Regulatory Agency for Electronic Communications and Postal Services (RATEL).

While data breaches appear rare, the government swiftly responded to isolated instances. For example, the Ministry for Privatization was completely dismantled after a 2014 data breach affected 5 million people. Cyber risks also affect the private sector, online media outlets, and CSOs. The cybersecurity readiness level of online media outlets and CSOs is low, and the potential for compromised accounts makes them particularly vulnerable to impersonation campaigns.[36]

33 The cybersecurity capacity review measures cybersecurity capacity across five dimensions: cybersecurity policy and strategy; cyber culture and society; cybersecurity education; training and skills, legal, and regulatory frameworks; and standards, organizations, and technologies. Source: "Serbia Has Undertaken Critical Steps in Cybersecurity, Says First Cybersecurity Capacity Maturity Model Assessment," World Bank.

34 DSP expert contributors answered the question, "Does the government have sufficiently technologically skilled staff and resources to mitigate harm from cyber-security threats?" on a five-point scale.

35 DSP does not disaggregate cybersecurity areas and therefore cannot highlight some illustrative areas in which Serbia lags behind the rest of Europe. As per the National Cyber Security Index (NCSI) there is no central government entity with a national level unit specialized in national strategic cyber threat situation analysis; there are no cyber security crisis management plans; and there are no bachelor-level programs focusing on cyber security, to give a few examples.

36 USAID Assessment: Internet Access Integrity in Eastern Europe, Serbia Country Assessment (2020).

DATA PROTECTION IN NAME ONLY?

While Serbia's foreign policy places an emphasis on striking a balance between the East and West, the longer-term trajectory leans toward EU accession. This inclination includes the adoption of technology policies that align with EU standards. One example is data protection and privacy, where Serbia's 2018 Personal Data Protection Law is heavily modeled on the EU's General Data Protection Regulation (GDPR). Critics of the Personal Data Protection Law described it as "cut and paste" legislation that neglects harmonization with Serbia's legal system and will likely result in implementation and enforcement challenges.[37] The resulting uncertainty around exactly what the Personal Data Protection Law requires may delay digitalization within the government and the private sector.

2.2.2. THE MULTI-STAKEHOLDER VIEW OF DIGITAL GOVERNMENT

While government-led initiatives are important, they are only part of the picture. In a thriving digital ecosystem, government, civil society, and the private sector collaborate around topics including data privacy, transparency, and internet governance.

OPEN GOVERNMENT DATA AND FREEDOM OF INFORMATION

Open data formally became a government priority as part of PM Brnabić's broader digitalization push. Serbia's National Open Data Portal launched in October 2017. It features data from national and local government agencies as well as sample analyses and visualizations. Academic or civil society groups often produce these analyses. Civil society interviewees commented that official engagement around transparency and open data is in decline.

In general, the government seems willing to open up data about quality-of-life issues (such as environmental quality, education, and health). Data about internal government processes (such as budgeting, procurement, and anti-corruption efforts) are harder to find. For example, the Open Budget Index rates Serbia as making "Minimal Information Available," with a score of 40. For comparison, the only European country behind Serbia was Bosnia and Herzegovina, scoring 33. While Serbia has been a member of the Open Government Partnership (OGP) since 2012, the OGP's Independent Reporting Mechanism hasn't found a significant change in openness.[38],[39] Some government bodies in charge of important policy areas, such as fiscal transparency, have not made the commitments that the OGP recommended. This refusal further limited the achievement of the goals outlined in the Serbian OGP Action Plan.

The general population seems unaware of the benefits of open government data. These benefits include increased transparency and accountability, increased citizen participation, and more data-driven decision making. Private sector use of open government data is limited. One of the five key 2019 OGP Independent Reporting Mechanism (IRM) recommendations for Serbia was to stimulate the reuse of open data.

37 There is already a troubling trend in the region regarding implementation, where some countries, including Hungary and Romania, have used GDPR to suppress stories unfavorable to friends of the government.

38 The Ministry of Public Administration coordinates Serbia's involvement with the OGP. See Box 3 for an example of how the OGP operates in Serbia.

39 The OGP is a multilateral initiative working to make governments more accessible, responsible, and accountable to citizens.

BOX 3: Informational booklets: an ambitious open government data initiative

Government agencies must regularly publish an information booklet.[40] These booklets often contain basic information including budgets, organizational structure, salaries, and compliance with public information requests. The booklets generally do not follow a standard format, which makes it difficult to compare information across agencies or over time. At one point, approximately 11,000 unstandardized Portable Document Format (PDF) booklets could be found online. The Ministry of Public Administration and Local Self-Governance is developing a database to host standardized, machine-readable copies of these booklets, increasing opportunities for analysis.

In many countries, open data is used most heavily by journalists and CSOs. In Serbia, these groups more frequently rely on Freedom of Information (FOI) requests. In Serbia the Access to Public Information Act facilitates FOIs, and a community of FOI activists supports them. The legal framework for requesting access to information is robust, as illustrated by Serbia's third-ranked position in the Global Right to Information Rating system. However, implementation and acceptance are lacking. Soon after the COVID-19 pandemic hit, Serbian officials began refusing FOI requests (even those unrelated to the pandemic). The government also extended deadlines for state institutions' response to a range of requests, including FOI.

EMPTY SEATS AT THE INTERNET GOVERNANCE TABLE

In 2005, the United Nations (UN)-sponsored World Summit on the Information Society offered an expansive definition of internet governance: "the development and application by governments, the private sector and civil society, in their respective roles, of shared principles, norms, rules, decision-making procedures, and programs that shape the evolution and use of the internet". Internet governance includes topics like internet identifier management, information-sharing, coordinated malware analysis and incident response, standard design and adherence, and domain management. The growth of the internet as a global, decentralized system has favored a multi-stakeholder approach, often operating through a combination of global and country-level fora.

In Serbia, this multi-stakeholder approach has seen some success. The Serbian National Internet Domain Registry Foundation (RNIDS), is an NGO and a multi-stakeholder consortium that manages the .rs national internet domain.[41] RNIDS is structured similarly to the Internet Corporation for Assigned Names and Numbers (ICANN). Both have strong representation from different stakeholder groups, including the government. In the early 2000s and prior to RNIDS, the academic community largely managed domain registrations for the .yu domain, but they struggled to manage the volume of registration requests. According to a former director of ICT policy and internet community relations at RNIDS, the successful multi-stakeholder approach at RNIDS is unique among countries in the region. Most of Serbia's neighbors have domain registries that one particular stakeholder group dominates. The former director attributed this success to the government's early recognition that they could not handle the problem on their own and needed to bring other stakeholders into the conversation.

Despite the multi-stakeholder approach of RNIDS, interviewees noted that the government seems largely absent from other areas of internet governance. Instead, civil society, ISPs, telecoms, and universities are having their own separate conversations. One interviewee commented that internet governance seems to be an afterthought for the government. Other stakeholders often have discussions without government involvement, while the government may make decisions without outsider input.

40 Example from the Treasury Administration.

41 A domain name registry is the database that maps human-readable domain names (such as usaid.gov) to Internet Protocol (IP) addresses (such as 209.222.18.222). This can be a contentious task, as domain names often have significant commercial and political value.

Another gap is the absence of a Serbian Internet Governance Forum (IGF) initiative (i.e., a local IGF chapter). One interviewee commented that previous efforts to stand up an IGF initiative failed due to the lack of a high-profile sponsorship. The Multistakeholder Advisory Group, which the UN Secretary-General appoints, annually convenes the global IGF. It is a forum for open and inclusive dialogue on internet governance issues, a venue to share best practices and experiences, a platform to identify emerging issues and bring them to the attention of the relevant bodies and the public, and a means to contribute to capacity development for internet governance. National-level IGF initiatives allow countries to discuss and address issues in a context-specific manner; currently there are 91 national IGF initiatives. There are also 19 regional IGFs, including the South Eastern European Dialogue on Internet Governance (SEEDIG). Although individual experts from Serbia have attended SEEDIG conferences, Serbia does not have formal representation.

2.2.3. INTERNET FREEDOM

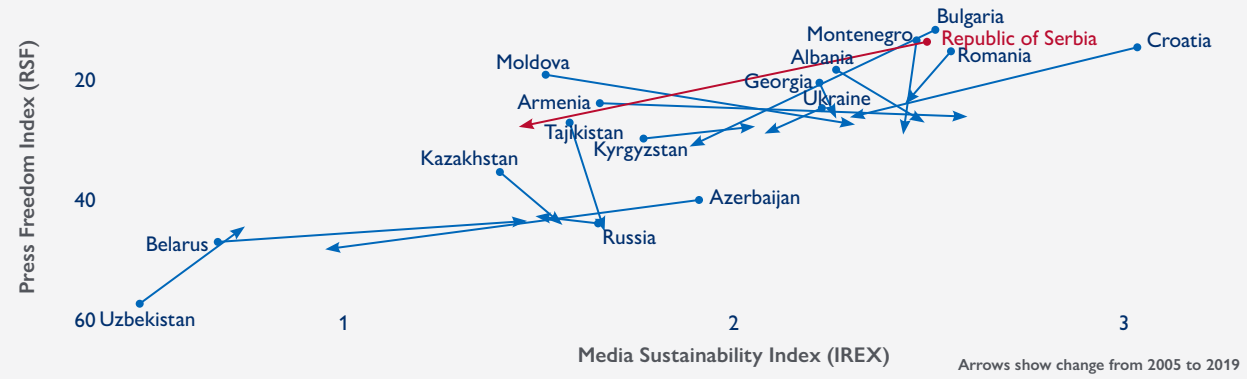
Internet freedom is the "exercise of internationally recognized human rights online, such as freedoms of peaceful assembly and of expression, including the freedom to seek or impart information and ideas of all kinds regardless of frontiers through any medium. By extension, it also includes the free flow of information that allows economies and societies to thrive." USAID's internet freedom work focuses on the digital security of civil-society and media organizations, encourages citizen engagement in internet governance, and promotes the recognition of human rights online.

Digital repression typically involves two interacting features – the shaping of public opinion through information control, and the erosion of individual agency through pervasive surveillance. These two elements can reinforce each other, such as when clandestine images and recordings of opposition figures are leaked to state-aligned media, and a shrinking civic space leads to greater reliance on official sources of information. This section first reviews the information landscape and then the state of surveillance in Serbia.

MASS MEDIA AND POLITICAL CONTROL

Like many of its neighbors, Serbia's rankings on both the Reporters Without Borders Press Freedom Index and the IREX Media Sustainability Index have declined steadily since the mid-2000s. While freedom of expression is legally guaranteed, the indices imply that it is becoming more limited in practice. This diminishing freedom of press reflects a worrying trend across the Balkan region (**FIGURE 12**).

FIGURE 12: Press freedom and media sustainability, 2005-2019



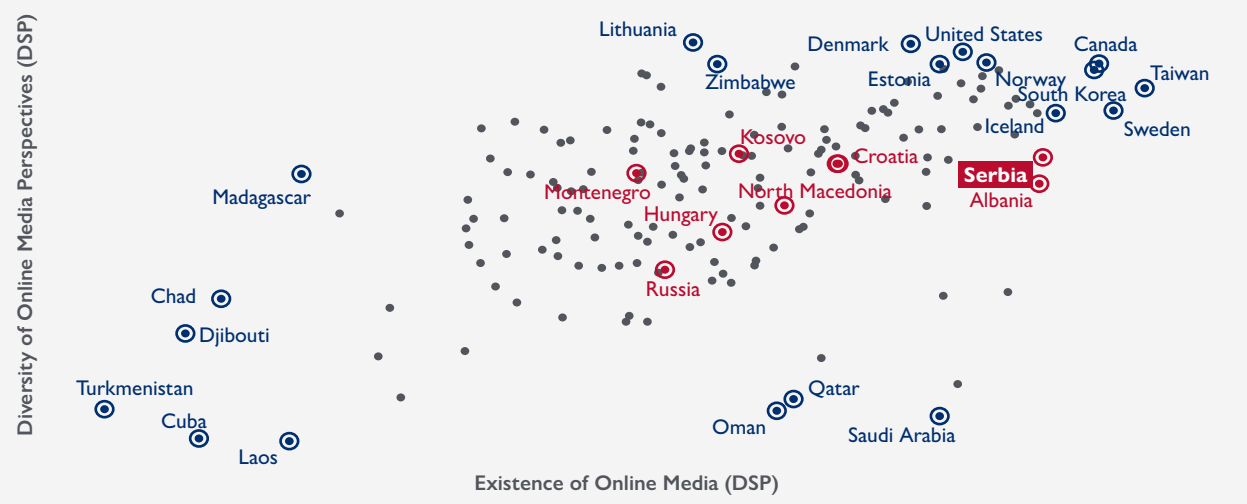
Source: Media Sustainability Index (MSI), IREX ; Press Freedom Index (RSF)

MEDIA-CONSUMPTION GAPS

Television dominates Serbian media consumption; 91 percent of Serbians engage with TV daily. Media consumption differs by age, and older populations primarily drive Serbia's high TV viewership. People older than 50 tend to out-watch other age groups by two to five hours. Youth interact more with digital media platforms and social media. Individuals between the ages of 15 and 44 are the most frequent internet users, and time spent online continues to grow (from 126 minutes in 2013 to 189 minutes in 2020).[42]

According to data from the Digital Society Project (DSP), digital media is more widespread in Serbia than in other countries in the region, on par with wealthier countries in Western Europe (see **FIGURE 13**). DSP also rated the diversity of perspectives available in online media, with only government-aligned content available in countries such as Cuba and Saudi Arabia and more diverse viewpoints available in Lithuania or the United States. On this measure, Serbia also ranked higher than many of its regional counterparts, reflecting an appetite for independent online media, at least among those who consume it.

FIGURE 13: Online media and diversity of perspectives



Source: Digital Society Project data

Large, government-influenced media conglomerates hold considerable sway over the media landscape, but the demand for local independent media seems to be growing, and niche audiences may be willing to pay (at least a little) for alternatives. These independent media operations are most popular with young, urban, highly educated, and high-salary demographics. Over just a year, the percentage of people willing to pay for at least some online content increased from 21 percent to 36 percent.[43] Interviewees noted that digital media primarily caters to computer users and identified a missed opportunity for reaching educated, digitally savvy audiences via mobile-device-capable websites and apps.

Traditionally, independent media outlets can source some funding from their consumers. However, in Serbia most media outlets are old-fashioned and "introverted." They aren't ready to open up communication with their audience; therefore, their consumers do not produce dependable funding streams. Moreover, the application of digital payments for donations, subscriptions, and membership with independent media outlets is a fairly new concept in Serbia. Since January 2019, the USAID Strengthening Media Systems project (SMS) has been testing online fundraising models with several independent media outlets. The aim is to promote a culture of digital

42 USAID internal assessment: Media Market Overview for Serbia, BiH, North Macedonia, Montenegro, and Kosovo (November 2020)

43 USAID Assessment: Audience Behavior and the Effects of Free Media Advocacy Campaign (unpublished).

payments use among such media outlets and their consumers. Preliminary findings show that donation models based on one-off payments (promoted through sustained campaigns) are most viable for civil society/NGO-run media, while recurring payment options such as memberships work well for traditional, daily media that have a loyal consumer base.[44] However, challenges remain with digital payment services (see Section 2.3.3).

MISINFORMATION, DISINFORMATION, AND INFLUENCE OVER MEDIA

Disinformation and misinformation are challenges for independent media, and ultimately for democracy itself.. According to a nationally representative 2019 survey conducted via the SMS project, 24 percent of respondents cited fake news as the greatest issue facing Serbian media, and 16 percent pointed to "politically-influenced media".[45],[46] Seventy-seven percent of Serbians believe there is false news in their country's media.

KEY TERMS: Mis- vs. Disinformation

Misinformation refers to any false or inaccurate information, such as rumors and hoaxes. Social media platforms are often used to spread misinformation.

Disinformation is defined as false information spread with the specific intent to deceive, manipulate, or influence behavior. It differs from misinformation because it requires malign intent.

Limited consumer media literacy is a major hurdle for combating disinformation. While people may be aware of disinformation, they may not be able to detect it. Almost half of those polled in a USAID SMS project survey had little to no knowledge of the origin of their news. Only about 8 percent were diligent about always paying attention to their sources. The project reported that while respondents access online content most commonly either directly or via a search engine, access through social networks is increasing. As a result, people are often unaware of the legitimacy of news sources and may therefore be susceptible to misleading information (e.g., fake news).

A general lack of consumer trust in the media also undermines efforts to combat mis- and disinformation. Serbia ranks near the bottom for trust in traditional media and digital media according to a 2019 IPSOS poll, with public trust in digital media being higher than in traditional media (88 percent of respondents noted they have "not very much trust" or "no trust at all" in print media; 81 percent for television and radio, and 69 percent for online media.) Unsurprisingly, the USAID SMS project survey also reported that TV stations were perceived to be the main providers of misleading content, yet they remain the dominant media consumption medium in Serbia.

A timely example of misinformation surrounds 5G in Serbia. Conspiracy theories linking the installation of 5G hardware to the spread of coronavirus or claiming that radiation from 5G causes cancer have led to growing anti-5G sentiment in many communities. This sentiment impedes the planning and deployment of 5G technology, as local buy-in is key to a successful rollout. Meanwhile, experts agree that national and local authorities, as well as telecommunications operators, should be doing more to inform the public on the facts about 5G and dispel misinformation.

44 USAID Assessment: SMS e-Payment Initiatives: Overview and Initial Findings (unpublished).

45 The CeSID research implemented in 2019 combined a variety of methods and techniques (a face-to-face-survey and computer-assisted web interviewing, or CAWI), and targeted a number of groups: a representative sample of 1500 respondents age 15 to 65 for the face-to-face survey, a sample of 100 daily internet users for web interviews, and 96 internet and local media users aged 15 to 65 for the 12 focus group discussions in Belgrade, Niš, Kragujevac, Novi Sad, Sombor, Loznica, and Zaječar.

46 USAID Strengthening Media Systems Project: Fact Sheets: Serbia

SUSTAINABILITY CHALLENGES FOR INDEPENDENT MEDIA

In Serbia, public interest media grants that are intended to co-finance non-profit content are instead used as subsidies for commercial media. This dynamic distorts the media market and undermines the financial viability of independent media. Some outlets utilize advertising revenue, but even outlets that successfully do so are at a barely sustainable level. Google and Facebook, rather than Serbian outlets, capture much of the digital advertising revenue. The USAID SMS project and the USAID-funded Balkan Media Assistance Program have encouraged alternative financing models. Proposed models include a combination of advertising, project financing, direct contracting, donor funding, subscriptions, and crowdfunding.[47] Recently, improved technology infrastructure has opened doors for media financing. Until recently, websites were clunky and lacked modern designs. Few had paywalls or other monetization mechanisms. Although website capabilities have advanced, digital payment-dependent monetization models still face implementation challenges due traditional policies by the National Bank of Serbia. This is primarily connected to the Law on Financial Services (also discussed in connection with the digital economy in Section 2.3.3).

Financing challenges are not the only thing holding back independent media outlets; key personnel often have limited business acumen. As one interviewee noted, "[Media outlets] run on a legacy of hero journalism. They reject business acumen as a perversion of what journalism is supposed to be." Lack of business acumen is an even bigger issue for media outlets in smaller cities and rural areas, where finances are tighter and resources scarcer. In contrast to the global trend towards digital media, some digital-first media outlets in Serbia believe they must expand to print media to reach a bigger audience.

Despite these challenges, investigative journalists publish important stories and view themselves as an oasis of accurate information. The COVID-19 pandemic has accelerated this perception of independent media and CSOs as the place to go for accurate, objective information. Interviewees noted that people in Serbia seek fact-based sources when the stakes are higher. For example, with the onset of COVID-19, a fact-checking website saw about a 10-fold increase in audience size over the pre-COVID-19 levels, demonstrating that at least a part of the public has a growing interest in verifying their news sources.

BOX 4: Digital rights are human rights

Digital rights are the human and legal rights to use, access, create, and publish content online, along with accessing and using telecommunications networks and other electronic devices. The primary use for this term is in the protection and translation of existing rights into a digital space, such as the right to privacy and the freedom of expression. These principles have been synthesized into the Charter for Human Rights and Principles for the Internet. The COVID-19 pandemic confirmed for one interviewee that Serbian society lacks awareness of digital rights issues, including freedom of expression online and the right to remain anonymous. The biggest digital rights issues in Serbia are online smear attacks and hate speech. These issues primarily target Kosovar, Roma, and immigrant populations.

Journalists are also keenly aware of digital rights issues in Serbia. Journalists who publish critical information are concerned about their digital privacy, with good reason. Journalists have had electronic communications monitored and used as a basis for smear campaigns designed to discredit them. Despite the lack of awareness in broader Serbian society, there is a strong cohort of digital rights CSOs that lead efforts to socialize and monitor digital rights issues.

47 USAID/Serbia shared preliminary data from new SMS project models showing a positive return on investment (in some cases, a significant return). For example, out of 31 supported media outlets, 29 managed to expand their online audience. The biggest obstacle is media stakeholders/owners' old-school mindset and their ability to understand the digital world.

2.3. PILLAR 3: DIGITAL ECONOMY

Digital Economy explores the role digital technology plays in increasing economic opportunity and efficiency, trade and competitiveness, and global economic integration. Areas of inquiry include digital financial services (credit or debit cards, payment apps, mobile money, and digital savings and loan products), financial inclusion, regulation of digital finance, digital trade, e-commerce, and the financial technology (FinTech) enabling environment. This pillar also assesses strengths and weaknesses in the local digital talent pool and the tech startup environment; a healthy digital economy requires a supply of ICT skills that matches the demand and an ecosystem that promotes technological innovation.

INTRODUCTION

Digitalization of the economy is a priority in Serbia's route to digital transformation. With a vast pool of affordable, highly qualified ICT talent, Serbia has the potential to create products that can compete globally and to have a thriving tech startup ecosystem. Growth across the startup and e-commerce sectors has been slow – much of the resistance to adoption is rooted in providers' and consumers' lack of trust in digital tools. However, the COVID-19 pandemic has been a significant driver of digital transformation and has paved the way for increased use of digital tools and services in the economy.

2.3.1. A STRONG ICT TALENT POOL

Serbia has a talented pool of ICT experts, with 2.6 percent of the total employed population in ICT. In general, Serbian ICT professionals are more likely to work as contractors or freelancers than as full-time employees. Despite the average salary of ICT professions being higher than the median salary in Serbia, many ICT-trained Serbians choose to emigrate.

BRAIN DRAIN AND THE STRUGGLE TO RETAIN HIGH-LEVEL ICT TALENT

Youth unemployment in Serbia is quite high, at approximately 27.5 percent. This is likely a driver of the huge Serbian diaspora (about 10 percent of the total population).

This issue is a symptom of a larger problem. Among Serbians surveyed for the 2019 Balkan Barometer, 21 percent cited brain drain — the outward migration of highly skilled people — as one of the most pressing problems facing their economy. Forty-nine percent mentioned unemployment. For ICT professionals, emigration is not simply a matter of salaries, but also the desire to have an overall higher quality of life. Salaries for ICT professionals in Serbia are high given the low cost of living, even though the median salary for a software engineer is approximately 19,400 USD in Serbia, compared to 58,000 USD globally.

Recent changes to tax laws may favor ICT talent and help organizations to retain skilled employees. ICT professionals in Serbia often work as freelancers (for both foreign and domestic companies) and have very little worker protection. Until recently, a loophole allowed companies to pay lower taxes on contractors than on normal employees, so they would preferentially hire freelancers over employees. This issue has been mostly addressed, with an industry push to hire all previous contractors as employees in order to qualify for a tax break from the government.

ICT OUTSOURCING: A DYING BUSINESS, BUT NECESSARY FOR THE SHORT TERM

Transitioning from an IT hub known for outsourcing, to a fully developed digital ecosystem with its own products and companies is important for Serbian economic development. As an interviewee noted, "outsourcing is a dying business. [Companies] are aware that they need to design their own product, but it is a secondary priority unless there is money available."

Given the relatively inexpensive salaries for hiring developers, there is a big draw for foreign companies to establish IT centers in Serbia and hire Serbian ICT specialists, especially for outsourcing jobs. Serbia's technical talent is often outsourced to more developed countries. Even startup companies take these outsourcing jobs to pay the bills, as opposed to spending adequate time innovating, testing, and building their networks. The onset of the COVID-19 pandemic has shown that more work can be done remotely than originally presumed, leading companies to potentially look further east (e.g., Ukraine) for even more affordable talent.

2.3.2. A GROWING TECH STARTUP ECOSYSTEM

Serbia has a budding tech startup ecosystem with a handful of key players — both public and private—helping to propel its growth.

Serbian startups face many of the same challenges and problems as others around the world: lack of seed funding and a lack of business acumen amongst startup founders. The two big questions one must address as an entrepreneur in Serbia are, "how are you going to get funding to start?" and "how are you going to sell your product?".

LACK OF BUSINESS ACUMEN

Anecdotally, startups lack business acumen because their founders tend to be engineers who lack training that would allow them to handle sales, project management, or expansion into a larger market. Approximately 87.3 percent of students know very little, or nothing, about entrepreneurship. Additional team members often do not fill gaps in business-related skill sets due to funding constraints or failure to recognize their importance. These major gaps can hinder the growth of startups, keeping them from reaching their potential quickly.

For this reason, Serbian innovation hubs such as Startit, Impact Hub, and Nordeus Hub emphasize having a good, diverse team as a key to startup success. In fact, one respondent ranked having an excellent team that is adaptable to change as a better indicator of success than having an excellent product. One key feature of adaptable teams is diversity – across educational backgrounds, skill sets, and gender.

FUNDING CONSTRAINTS

Tech startups in Serbia rely on funding from several sources: venture capital funding, angel investors, personal capital (money from either friends or family), and government innovation funds.[48] Currently there are only two main venture capital firms: South Central Ventures, and ICT Hub Ventures. ICT Hub Ventures tends to offer limited funding (up to about 80,000 EUR), that barely allows startups to get off the ground, while South Central offers larger amounts (about 100,000 EUR), for which most startups are not developed enough to compete.[49]

Although rare, angel investment does exist in Serbia, including a unique all-women angel investor network operated under Impact Hub Belgrade. In general, however, a lack of policy to incentivize investment obstructs investment. That, along with the conservative mindset of most investors in Serbia, leads to low involvement of angel investors in the Serbian ecosystem.

Aside from private-sector investment, there is also financial and advisory support for startups from the Government of Serbia, in alignment with its digital agenda. The Innovation Fund is a part of this initiative. The

48 An angel investor is an individual who provides capital for a business start-up, usually at the very initial stages when other investors aren't usually prepared to back them yet.

49 These numbers are rough, based on information provided through interviews.

Cabinet of the Minister of Innovation and Technological Development and the Ministry of Education, Science and Technological Development jointly operate the Fund. It has several programs, one of which (the Mini Grants program) targets "private young enterprises which are engaged in the development of technological innovations with a clear market need," offers financing startups up to 80,000 EUR for a single year, and focuses on building a project within the year. For a startup, often having a viable product within a year is too short a timeline. Some interviewees felt that a better approach would be to spend that first year setting up a robust business case for the product, growing a team, and developing a professional network. Those preparatory steps would allow for a smoother eventual product launch. Additionally, critics of the Fund have alleged that design and management flaws in government subsidies intended to help entrepreneurs result in the crowding out of private venture capital investors. Ultimately, despite this relative lack of investment opportunity in the ecosystem, not all startups are stifled equally — the stronger startups in Serbia have alternate funding mechanisms that help them avoid these problems.

TABLE 2: Differences between startups and micro, small, and medium-sized enterprises (MSMEs)

	STARTUP	MSME
Rate of growth	Scales quickly; often loses money before reaching a profitable scale	Growth is not always the goal; provides stable employment for proprietors
Size	Grows exponentially to be able to compete globally	Any size that is sustainable
Funding	Venture capital or angel investors – ideally investors that can take risks and absorb losses	Usually banks, personal finance, or other forms of funding

BOX 5: Understanding the general business environment in Serbia

Interviewees highlighted several challenges that are disrupting the general business environment in Serbia, whether companies are digitally aligned or not. To fully understand the opportunities and risks for businesses in the digital ecosystem, one must consider these challenges. Note that this is not an exhaustive list of challenges; further, targeted assessments would help to understand the general business environment in Serbia.

A common problem shared across companies – big or small – is the issue of illicit trade and non-conformity of rules. When certain companies bend the rules, it becomes difficult for rule-following companies to do business with them, or to compete against them. Small companies face additional hurdles. First, a lack of financing affects the way small businesses can operate – less money means a weakened ability to hire the right people for the right jobs, and take different opportunities to grow. Being unable to hire relevant staff also means that small businesses likely do not have legal teams to deal with unexpected changes to regulations and are therefore prone to facing negative consequences more than a large company with a fleet of legal advisors would be. Startups often start small, and with few funding sources available to them, they are also likely to face these challenges. Given that the e-commerce space in Serbia is also nascent, they can expect to experience similar challenges.

A SLOW GROWTH MINDSET

A 'startup mindset' involves having the drive to grow quickly, take risks, and endure several years of losses to be profitable in the long run once the business has a global footing.[50] Most startups in Serbia have not adopted this approach, and it is very difficult to survive initial losses without venture capital funding. The velocity with which

50 For context, it took Amazon six years to turn a profit (from 1995 to 2001), and even then it was a tiny fraction, $0.01 per share on revenues over $1 billion. Uber has yet to report a profit.

companies intend to grow highlights the key distinction between startups and MSMEs. As one interviewee put it, if startup company founders were given the option between seeing themselves as Mark Zuckerberg versus living in Belgrade and have a family business they can pass down to their children, they would choose the latter.[51] They also said:

> "Serbia has been in the development phase for too long. To accelerate the Serbian economy, it is necessary to boost the startup mindset with both the policy change makers and the intervention of implementers - it is only with the startup mindset that [the] Serbian economy can make the necessary leapfrogging."

To compete on a global scale, startups need to be able to grow quickly, which requires seed funding. Effective seed funding allows for flexibility, with less oversight than traditional lending sources such as banks and typically conservative Serbian investors. Without up-front investments to overcome the first few months (or years) without profit, it can become prohibitively expensive to continue. This dynamic also leads to a very common trap, in which entrepreneurs prioritize short-term stability over long-term growth by transitioning their focus from a startup to a 'lifestyle business' with a small number of reliable clients.

This lack of funding is even more pronounced for female entrepreneurs (startup or otherwise), the vast majority of whom are reportedly self-funded, further inhibiting their involvement in the startup ecosystem. Women often do not have the collateral needed for a loan from banks – only 25 percent of women are property owners in Serbia. According to the Innovation Fund, most applicants are men, and there are no gender quotas, which severely limits would-be women entrepreneurs.

BOX 6: Gaming and blockchain are among the strongest startup sectors

Two strong startup subfields are worth noting in Serbia – those revolving around gaming and blockchain. Nordeus, the company behind Top Eleven (a football management game), exemplifies the success of the gaming industry. Due to their massive success (with more than 180 million users), they have cultivated their own network with the introduction of Nordeus Hub, a coworking space for gaming startups. Nordeus Hub offers startups an intensive program with six to seven months of office space, mentoring, and workshops to bring teams' game concepts to fruition, and to build and attract talent to Serbia. This concept has the added benefit of building business acumen among startup entrepreneurs, and building up the team as a whole instead of individuals from the beginning of a project, which is the key to success in many startups.

The takeaway from Nordeus' success at cultivating a gaming startup scene is that they have developed a niche by specializing in gaming and cultivating a network of like-minded entrepreneurs. Another benefit of the gaming industry is the funding scheme – funds primarily come from game publishers, who assume the risk of the startup. This funding route is more similar to those of startups in mature ecosystems, and it shows how startup-oriented capital can succeed in Serbia.

Blockchain is another startup area in which Serbia is quite strong, ranking among the top five startup ecosystems in the world in number of blockchain developers. Most of the startups using blockchain get their funding from initial coin offerings (ICOs), which is a variant on the more traditional initial public offering that a conventional company would make upon going public. ICOs are widely considered to be risky for investors and have drawn regulatory scrutiny in many countries, including the United States and China. The biggest ICOs in Serbia include those by GameCredits ($56 million) and OriginTrail ($22 million).

51 This choice likely applies even for larger companies.

The unusual success of Serbia's gaming and blockchain startups highlights the importance of seed funding. These startups have found sources of starting capital that are unavailable to others – either up-front investments by game publishers or cryptocurrency ICOs. Expanded early-stage funding opportunities may unlock the potential of Serbian startups in other business sectors as well.

Startups are most successful when they attack niche markets, as demonstrated above. The startup ecosystem rewards specialization. The issue of specialization was echoed all throughout the DECA interviews: specialization within the startup ecosystem, whether in gaming or blockchain or some other sector, allows startups to collaborate more, have access to more resources as the ecosystem grows, and with a larger ecosystem, compete less among themselves.[52] Success most often comes when attacking a problem that large corporations are not addressing.

THE GEOGRAPHY OF STARTUP INNOVATION

In general, startup experts emphasize the importance of reaching "critical mass," with a significant geographic concentration of companies, investors, and supporting institutions to kickstart sustainable growth. Hotspots like Silicon Valley in California or Zhongguancun in Beijing are often cited as examples for aspiring startup ecosystems to emulate. The founder of a global startup advisory and research center emphasized the cultural expectations that global startup culture creates – young entrepreneurs don't want a suburban technology park; they want to be "in the center of the action" in a dense urban area. Co-creation spaces and incubators often anchor a growing startup community. Belgrade's startup ecosystem may have approximately 300 companies at any given point, while a fully self-sustaining ecosystem requires between 600 and 700. [53]

The Cabinet of the Minister of Innovation and Technology Development is pursuing a different approach by promoting Science and Technology Parks outside of Belgrade. Within a few years, the Cabinet has built three Science and Technology Parks between Belgrade, Novi Sad, and Niš, in addition to startup hubs in areas that lack an urban center. Their goal is to provide the same opportunities to talented youth outside of Belgrade. They aim to develop innovation infrastructure throughout the country, foster academia-industry partnerships, and encourage global companies to invest in research and development centers in peri-urban areas of Serbia.

These two ideas are clearly at odds. Startup ecosystems center around cities, not entire countries. On the other hand, the anti-centralization argument appeals to intuitive (and politically popular) notions of equity and inclusion.

Startup ecosystems inherently drive inequality. Between 80 percent and 90 percent of startups fail, typically between the second and fifth year of operation.[54] This dynamic leads to a high-stakes system of winners and losers. The biggest success stories (so called "unicorns", companies valued at more than $1 billion USD) can become a major economic boon for the country (and certainly for their founders). Silicon Valley's struggles with inclusion and diversity are well-documented; part of the reason is that the wealthy and well-connected have more access to the financial and human resources that increase their odds of success. Including Serbia's marginalized populations in the innovation economy will require attention to funding and mentorship, in addition to geography.

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52 A natural question arises when it comes to competition: is less competition better for a startup ecosystem? Competition in many senses is good, but startup specialization helps, because not everyone competes against each other. In attempting to sell cybersecurity services, only a few are going to succeed; however, having a couple cybersecurity firms, some online retail apps, a food delivery app, and a biotech startup are going to expand the overall market for the ecosystem.

53 This number was estimated using an ecologically-inspired statistical technique called "mark and recapture." It is used to estimate the size of a population where counting the entire population is unfeasible. The basics are to capture a subset of a given population, then allow some time to pass and recapture another subset of the population. The overlap of the two subsets can be used to estimate the total number in the population.

54 This estimate is based on Europe in general and is not specific to Serbia.

2.3.3. DIGITAL FINANCE: STUCK IN THE PAST, INCHING TOWARD THE FUTURE

In Serbia, digital finance is slowly making progress. There are three ways to make digital payments in Serbia: paying through a bank account (typically with a banking app), using a debit or credit card, or ordering online and paying cash on delivery. Serbia is still mostly a cash-based economy, however younger, urban people have adopted mobile banking quite easily. Banks are leading innovators in the digital finance space. Examples include issuing loans using signatures via short message service (SMS) and authentications; or using near-field communication (NFC) technology or quick response (QR) codes to enable touchless payments.

Regional comparisons of Central and Eastern Europe Bank customers from 2019 show that Serbian customers are, on average, least likely to use digital-only banking services and are among the most likely to use branch-only services.[55] In terms of using digital services, however, Serbian youth aged 15-29 years old far surpass the Serbian average of around 5 percent, at almost 12 percent, while also surpassing Austrian and Croatian youth in terms of digital-only banking use. These data show that while the technology is there, most older Serbians are not comfortable with it.

Interviewees also mentioned the matter of small, cash-based businesses not having to follow any financial reporting requirements. This issue often leads to no records of financial transactions, which makes it difficult for banks to analyze risk and provide loans. Digitization of their transactions would help increase transparency and make it easier for financial institutions to assess the risk of borrowers.

POST-YUGOSLAV TRAUMA HINDERS ADOPTION OF DIGITAL FINANCIAL SERVICES

There is a disconnect between digital literacy and digital financial literacy among Serbians; most people are becoming increasingly comfortable with digital tools but will default to analog tools when it comes to financial matters. Some of this lack of trust is due to the fact that consumers are unaware of the safety mechanisms associated with credit or debit cards. Consumer-protection laws and rights are also not widely-known. Another root cause may be the Yugoslav financial crisis of the early 1990s, when the country experienced some of the worst hyperinflation in history. In the new millennium, the 2008-2009 financial crisis further discouraged financial risk-taking; eastern Europe was among the world's most-affected regions. This economic crisis was probably more traumatic for Balkan countries than for the United States — one of the least-affected countries during that time. To offset the effects of the 2008 financial crisis, the National Bank of Serbia (NBS) had to stabilize the market by imposing stricter control over the financial industry.

Given the trauma of repeated financial turmoil, people tend to gravitate toward financial services that feel safe and secure, a hurdle that digital tools have yet to clear. Risk aversion also shows in the type of currency Serbians choose to use – although people use Dinars for their day-to-day needs, they save Euros as a way to hedge against hyperinflation. The NBS continues to regulate the financial market very strictly — interviewees have claimed that the Bank fears instability in the financial market and therefore opts to take very traditional, conservative routes that limit innovation in the financial sector. A commonly cited example has been the Foreign Exchange law, which restricts the outflow of money from Serbia.

Understanding these behavioral issues is important in the creation of a strong digital financial ecosystem. How people perceive risk drives financial decision-making. Several banks have mobile apps, but the number of people using them is relatively small (out of more than 9 million current account holders, only 2 million use mobile payments); they prefer to use cash.

55 Seven included countries are Austria, Croatia, Czechia, Hungary, Romania, Serbia, and Slovakia.

WITH DIGITAL PAYMENTS, CARDS DOMINATE

Among digital financial services, cards are perhaps the most common. Sixty-seven percent of people use credit cards at least once a week, with MasterCard, Visa, and DinaCard being the most common. The DinaCard is an NBS-sponsored payment card that can also be used for cash withdrawals.[56] DinaCard enables banks to offer their clients a payment card that consumers can use in Serbia without requiring any major upfront investment. Additionally, the card offers consumers the ability to conduct mobile phone payments, internet payments, and payments directly at Treasury Administration counters.

On the retail side, card payments can come in the form of loyalty programs, using a points system to encourage consumers to use them. SuperKartica — a loyalty program through one of the largest retail suppliers in Serbia — covers about 12 percent of all shoppers in Serbia. Serbian shoppers often avoid using bank accounts because they worry about missing some fine print, and therefore concentrate on cash. The loyalty program attracts customers by covering 15 different companies (ranging from fitness to interior design to insurance), and now has about 70,000 annual users. Currently, the primary users of the card are also most likely to use credit or debit cards; however, the incentive-driven loyalty programs are another promising avenue to encourage a switch to digital payments and build trust among consumers.

DIGITAL CROWD-FUNDING IS GROWING

The use of digital applications has also been addressed in the context of crowd-funding platforms – for humanitarian fundraising as well as for businesses. Funds can be collected through various means in the humanitarian context.[57] First, affinity credit cards allow clients of banks to donate a certain percentage of their transactions to an organization or cause about which they are passionate. Using this method, the USAID-funded Framework for Giving project in Serbia connected with local banks to feed 1 percent of every transaction into the project, collecting more than 60,000 to 70,000 EUR per year from users of the card. Donacije.rs is another platform for collecting donations among NGOs and raises funds for basic needs.

In the business context, 26 commercial banks offer loans to businesses; none of them are investment, development, or microfinance institutions (MFIs). Restrictive and outdated regulations (such as the Law on Foreign Exchange) prevent the establishment of MFIs and limit cross-border lending and the free flow of capital. Such regulation stifles the innovative digital financing options available to MSMEs in developed countries. MSMEs experience many of the same funding challenges that startups face (see section 2.3.3). According to USAID's Cooperation for Growth project (CFG), 79 percent of Serbian businesses (particularly MSMEs) are self-funded. Ventu.rs — a crowd-investing platform that BDO Serbia and CONDA (an Austrian crowd-investing firm) established — aims to enable businesses to collect funds from potential investors. With support from the USAID Cooperation for Growth project, Ventu.rs is the first new non-banking source available in the market in more than a decade. See **BOX 7** for a quick overview of the Ventu.rs business model. Ventu.rs has chosen to start with domestic investors, because previous attempts at international crowdfunding platforms resulted in numerous legal issues.

56 The National Bank of Serbia (NBS) set up the DinaCard system in 2003 in partnership with commercial banks, with the goal of developing non-cash payments, decreasing the quantity of cash in the money supply, and fighting the gray economy.

57 The Law on Foreign Exchange limits cross-border transactions, thus lowering the emergence and impact of digital financing and disabling free capital flows.

BOX 7: The Ventu.rs business model

1. Investors provide capital to the company through a subordinated loan and assume business risk.[58] Investors do not become co-owners in the company and do not have the right to control the company.
2. Any company or individual can invest a minimum of 100 EUR.
3. In return, the company pays the basic and bonus interest rate to investors, if its business is successful. The amount of the basic and bonus interest rate, as well as the dynamics of loan repayment, depend on various business indicators and requirements of the company's management. In the case of MSMEs, the bonus interest rate is based on the company's profit and is paid periodically, together with the basic interest rate.
4. The duration of the subordinated loan agreement for SMEs is between three and seven years.
5. Ventu.rs provides financing through crowd investing as well as experience and knowledge in marketing and public relations, corporate governance, and legal and tax issues. They also provide mentors who can help companies with their business strategy.
6. The preparatory costs are defined in each individual case and the commission is charged only if the crowd-investing campaign ends with success.

2.3.4. WAITING FOR E-COMMERCE AND DIGITAL TRADE TO DELIVER

E-commerce refers to the purchase of physical goods over digital platforms, which need to be shipped domestically or overseas. E-commerce can introduce several benefits to an economy, including reducing the presence of the gray economy, saving customers' time and offering more choices, and increasing transparency in transactions.[59] While digital trade and e-commerce are related, digital trade refers to cross-border trade flows of data, products, or services by electronic means, usually the internet. Digital trade plays a role in e-commerce by facilitating the purchase, selling, or servicing of physical goods and services.

SERBIA'S INVOLVEMENT IN GLOBAL DIGITAL TRADE

The current status of digital trade in Serbia is part of a larger trade picture, including Serbia's progress toward alignment with the WTO Trade Facilitation Agreement. A significant number of reforms have been implemented, indicating the country's interest and attention toward trade liberalization.[60] According to the UN Global Survey on Digital and Sustainable Trade Facilitation, Serbia has made significant strides in overall trade facilitation (TF) – moving from a score of 36.56 percent in 2015 to a score of 61.29 percent in 2019. In other words, as of 2019, Serbia had addressed and achieved a little less than two-thirds of all recommended measures. The trade facilitation score includes eight groups of measures around transparency, formality, institutional agreement and cooperation, paperless trade, cross-border paperless trade, SME-related TF, agriculture-related TF, and women-related TF. Among its notable achievements in digital and sustainable trade facilitation, Serbia increased its score on cross-border paperless trade by one-third, from a baseline of zero in less than two years – meaning the country implemented at least two of the six necessary measures for cross-border paperless trade in that time.[61] Along with its neighbors in the Western Balkans, Serbia still has room for growth, particularly in domestic and cross-border paperless trade.

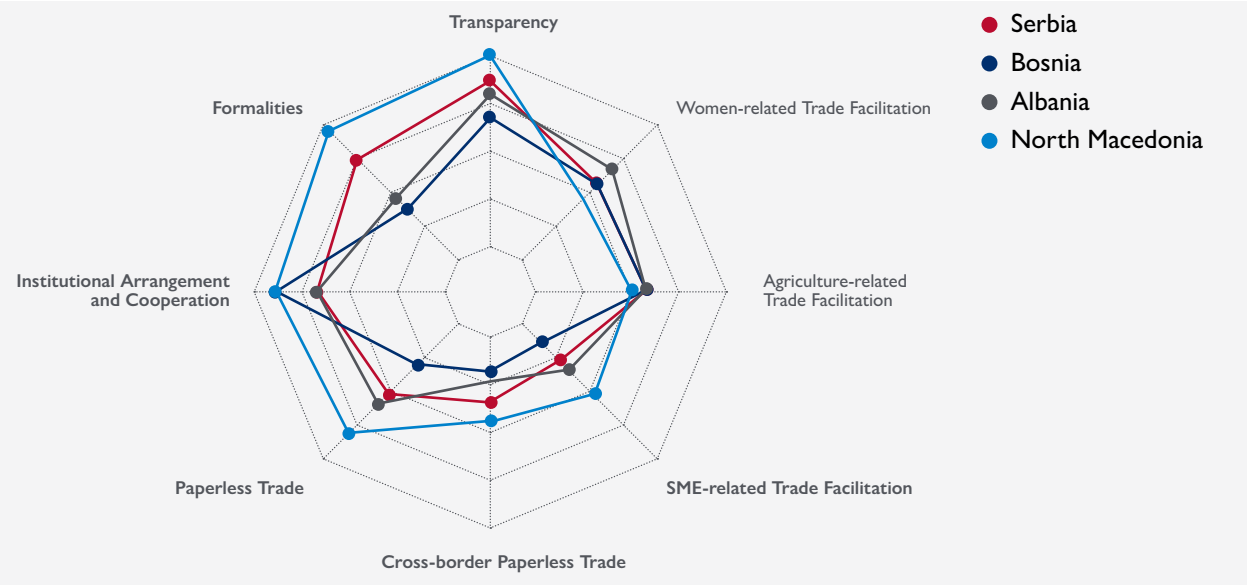
58 A subordinated loan is one that ranks below other (more senior) loans with respect to claims on assets or earnings. If the borrower defaults, subordinated debts are paid out only after the senior bondholders are paid in full.

59 The gray economy is the portion of a country's economic activity that is not accounted for in official government statistics; it is unofficial and unregulated.

60 See WTO's Serbia page for current status of the accession process.

61 See pages 3 to 5 of the UN Global Survey on Digital and Sustainable Trade Facilitation report for a list of all the relevant measures.

FIGURE 14: Trade facilitation in the Western Balkans



Source: *UN Global Survey on Digital and Sustainable Trade Facilitation*

BOX 8: Politicization of trade facilitation

The fact that Serbia is not yet a member of the World Trade Organization (WTO) complicates the topic of trade facilitation in the country. The problem dates to the aftermath of the Balkan conflicts of the 1990s – Western powers have indicated that they will block Serbia's accession unless Kosovo also joins the WTO as an independent country, while Russia has indicated that Serbia can join the WTO only after Kosovar independence is off the table. The strategic priorities of the Serbian government and the larger geopolitical dynamics in the Balkans will shape the future of Serbia's trade policy. Serbia's strongest trade ties are with Europe, in bilateral agreements with the EU (as an accession country) and the European Free Trade Association which ensures customs-free access for most market segments. At the same time, Serbia still misses out on other advantages of a single market (such as dispute-resolution mechanisms).

E-COMMERCE IN SERBIA AND COUNTRY-LEVEL POLICIES

E-commerce has been growing steadily in Serbia, with potential to expand further. The number of internet-mediated transactions in 2019 was up nearly 150 percent from 2018, with the value of these transactions increasing by 92 percent. This dramatic increase occurred *before* the COVID-19 crisis accelerated the growth of e-commerce; any COVID-related changes in adoption began from a baseline of rapid growth. There is significant room for growth from both the supply and demand sides of e-commerce (see more below), and organizations such as the E-commerce Association of Serbia, American Chamber of Commerce in Serbia, and the USAID Cooperation for Growth project have been steadily moving forward the e-commerce agenda.

The Government of Serbia has expressed support for the development of e-commerce, especially considering the government's digital transformation agenda. The Ministry of Trade, Tourism and Telecommunications (MoTT) adopted an E-commerce Action Plan for the 2019-2020 timeframe, aimed at wide improvements to e-commerce and e-business at a national level, a key priority of the Government of Serbia.

Under the EU umbrella, consumer protections exist on paper, but not in practice. According to interviewees, the regulatory environment is "fully aligned" with EU directives; however, effectiveness lags (for e-commerce businesses and others alike) in three main areas: i) the average consumer does not know enough about the

benefits of buying from registered businesses (such as consumer-protection laws); ii) regulators lack the capacity to effectively monitor things – the judicial system is cumbersome and difficult to navigate, leading to most consumers avoiding litigation; and iii) there is a lack of consumer-protection organizations.

BARRIERS TO E-COMMERCE

E-commerce in Serbia must still clear several hurdles from both the demand and supply sides to reach its full potential. The Strengthening E-commerce in the Republic of Serbia study by the Cooperation for Growth project in Serbia explores the state of e-commerce at length; below are a few highlights.

Demand-side challenges

The study cited several issues as barriers to e-commerce, including a lack of knowledge about e-commerce among the general public, mistrust in the purchase of products (e.g., customers feel they will not receive the product or it will arrive damaged), and a general mistrust of digital financial services (see section 2.3.3).

In Serbia, 52.3 percent of households own a laptop, and 94.1 percent own a mobile phone. In cases where e-commerce platforms are not mobile-friendly, the lower percentage of households with access to a laptop may limit increased e-commerce use. There is a general aversion toward e-commerce and technology among older shoppers (55 and older), including distrust towards digital platforms.

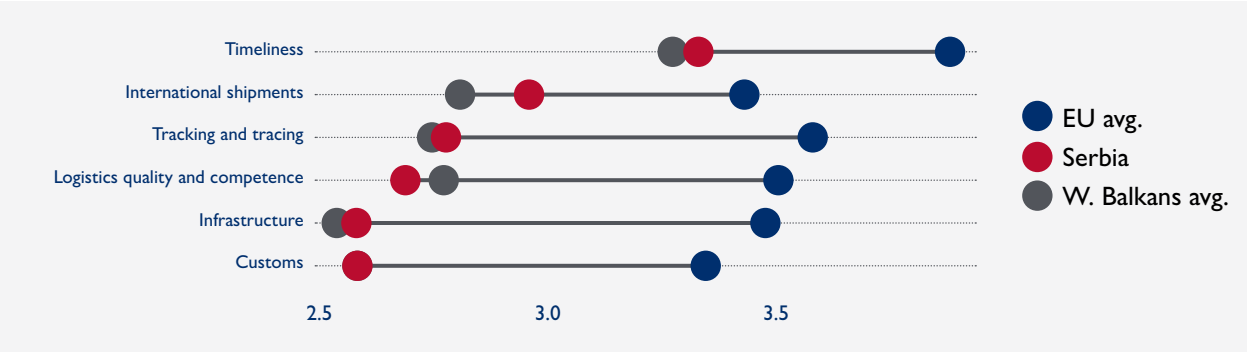
Transactions often begin online but are completed offline, i.e., consumers either order online and pay cash on delivery (a dominant form of payment in Serbia), or they browse online and go into a store to buy items. This dynamic boils down to a few key causes – mostly related to resistance toward use of digital payments (see Section 2.3.3 for lack of trust issues in the use of digital financial services). Consumers also lack a price incentive to convert to digital payments. This lack of price incentive may also push consumers toward purchasing items from unregistered sellers through Facebook and other social media platforms, where sellers offer cheaper prices and do not accept card payments so that they do not have to pay taxes.

Supply-side challenges

Online sellers in Serbia often face high operational costs. The country performs above average in most measures of logistics performance compared to the rest of the region, though it lags behind the EU across all indicators (see **FIGURE 15**). There are several reasons why logistics performance is poor in Serbia, relative to the EU. First, the market for state-wide logistics services is very concentrated, and these providers prefer to engage with large companies over MSMEs. When MSMEs are engaged, they are charged high fees, making delivery costs expensive. Additionally, fluctuating delivery times, damaged shipments, and limited parcel tracking options contribute to poor logistics performance. Interviewee comments also reflect this dynamic – those who have attempted to develop e-commerce platforms often are not well versed in supply chain management, which leads to poor customer service from local vendors or courier service providers. Inefficiency of the national postal system further adds to poor delivery systems in the country.

International shipments face additional hurdles – a few items can be directly shipped to Serbia through Amazon, but in most cases Serbian customers have to pay high delivery charges and local customs, and they face administrative difficulties when they try to shop through Amazon USA, UK, or Germany.

FIGURE 15: Components of logistics performance index



Source: The World Bank.
Notes: International shipments is assumed to be for both export and import here. The World Bank defines this indicator as "ease of arranging competitively-priced shipments."

In Serbia, payment systems impose high transaction fees that can make online sales less attractive for customers. Between 2007 and 2014, Banca Intesa monopolized the e-commerce payments market, charging a high transaction fee of 5 percent. Currently only five domestic banks provide e-commerce payments options, with only 450-500 of the estimated 3,000 online stores accepting card payments online. Due to COVID-19, however, companies online store fronts are significantly more likely to accept online payments than in 2019 (63 percent in 2019, compared to 73 percent in 2020). Change takes time, largely due to the NBS' conservative stance on modern payment methods.

Major online platforms such as Amazon or Alibaba that enable low-cost placement of goods do not operate in Serbia, because the market is too small for them to create localized e-commerce websites or build local distribution and logistics hubs.[62] This leaves Serbian companies with little access to large platforms that could accelerate their growth. As a result, companies in Serbia must rely on informal platforms such as Facebook, or develop and maintain their own online presence without sophisticated features such as user analytics or good cybersecurity. MSMEs often lack time, resources, and the basic knowledge or skills to compete online and tend to be very risk averse. Initiatives such as the USAID Cooperation for Growth project recognize the need for focusing on local or regional marketplaces such as Shoppster, the regional platform the United Group launched in September 2020.

ADOPTION DURING CRISIS: THE COVID-19 PANDEMIC

One of the most significant recent drivers of accelerated e-commerce adoption has been the COVID-19 pandemic. With the closure of shopping centers, there was a large drive to move online. Once customers tried using online platforms, they realized they are "not scary" and quite convenient. When shopping centers reopened, online shopping saw only a small decrease from the peak of the pandemic. According to the latest data from NBS, internet points of sale using cards or e-money increased by almost 42 percent between Q2 of 2019 and Q2 of 2020.[63] According to experts, the most common practice is still researching goods and services online and purchasing offline, but data for a few illustrative industries show that consumers are increasingly moving toward fully-online transactions.

62 As an example, Amazon just launched in countries like the Netherlands (in March 2020) and Sweden (in September/October 2020), adding to the "giant" European markets on which they focus, including France, Germany, Italy, Spain, Turkey, and the United Kingdom.

63 NBS is monitoring payment transactions of the purchase of goods and services via the internet online where cards or e-money are used (therefore not covering ecommerce where other payment methods are used, such as cash on delivery, money transfer, e-banking, or m-banking).

BOX 9: Digital literacy in the context of the digital economy

Interviewees identified a need for strengthened digital literacy in several economic sectors, from agriculture to e-commerce.

In the context of e-commerce, interviewees define basic digital literacy as:

- the ability to use digital technologies to promote oneself and one's business through social media channels;
- have e-commerce capabilities (such as an online shop, the ability to order food online, or a way to exchange business services over the internet), and;
- the ability to conduct banking transactions through digital channels (including digital payments).

In Serbia, in addition to the challenges described in this section, a barrier to e-commerce growth is the lack of educational infrastructure to systematically change the e-commerce landscape. Experts suggest that university professors often lack the requisite specialized technical knowledge to teach e-commerce skills (such as the importance of last-mile logistics) to their students. In addition to these supply side barriers, a lack of awareness of e-commerce applications, how to use them, and legal protections pertaining to them can also be a deterrent to increased and efficient use of e-commerce services for consumers.

Appendices

A. Definitions

Definitions from USAID Digital Strategy 2020-2024 unless otherwise mentioned.

Civil Society Organizations (CSOs): CSOs represent a wide array of stakeholders: community groups, non-governmental organizations (NGOs), labor unions, indigenous groups, charitable organizations, faith-based organizations, professional associations, and foundations.

Cybersecurity: The prevention of damage to, protection of, and restoration of computers, electronic communications systems, electronic communications services, wire communication, and electronic communication, including information contained therein, to ensure its availability, integrity, authentication, confidentiality, and non-repudiation.

Cyber Hygiene: The practices and steps that users of computers and other devices take to maintain system health and improve online security. These practices are often part of a routine to ensure the safety of identity and other details that could be stolen or corrupted.

Data Privacy: The right of an individual or group to maintain control over, and the confidentiality of, information about themselves, especially when that intrusion results from undue or illegal gathering and use of data about that individual or group.

Data Protection: The practice of ensuring the protection of data from unauthorized access, use, disclosure, disruption, modification, or destruction, to provide confidentiality, integrity, and availability.

Digital Divide: The distinction between those who have access to the internet and can make use of digital communications services, and those who find themselves excluded from these services. Often, one can point to multiple and overlapping digital divides, which stem from inequities in access, literacy, cost, or the relevance of services. Factors such as high cost and limited infrastructure often exacerbate digital divides.

Digital Economy: The use of digital and internet infrastructure by individuals, businesses, and government to interact with each other, engage in economic activity, and access both digital and non-digital goods and services. As the ecosystem supporting it matures, the digital economy might grow to encompass all sectors of the economy—a transformation driven by both the rise of new services and entrants, as well as backward linkages with the traditional, pre-digital economy. A diverse array of technologies and platforms facilitate activity in the digital economy; however, much activity relies in some measure on the internet, mobile phones, digital data, and digital payments.

Digital Ecosystem: The stakeholders, systems, and enabling environment that together empower people and communities to use digital technology in order to gain access to services, engage with each other, or pursue economic opportunities. A digital ecosystem is conceptually similar to, but broader than, a digital economy. Although certain aspects of the digital ecosystem have country-wide reach, other features differ across geographies or communities. The critical pillars of a digital ecosystem include: 1) sound enabling environment

and policy commitment; 2) robust and resilient digital infrastructure; 3) capable digital service-providers and workforce (e.g., both public and private institutions); and 4) empowered end-users of digitally enabled services.

Digital Identity: The widely accepted Principles on Identification define identity as "a set of attributes that uniquely describes an individual or entity." Digital identification (ID) systems often require registering individuals onto a computerized database and providing certain credentials (e.g., identifying numbers, cards, digital certificates, etc.) as proof of identity. Government actors can set up these systems to create foundational, national ID programs, or donors or non-governmental organizations (NGOs) for functional purposes to identify beneficiaries, e.g., for humanitarian assistance and service-delivery.

Digital Literacy: The ability to access, manage, understand, integrate, communicate, evaluate, and create information safely and appropriately through digital devices and networked technologies for participation in economic, social and political life. This may include competencies that are variously referred to as computer literacy, information and communication technology literacy, information literacy, and media literacy.

Disinformation: Disinformation is defined as false information spread with the specific intent to deceive, manipulate, or influence behavior. It differs from misinformation because it requires malign intent.

Internet Service Providers (ISPs): ISPs include both fixed-line and wireless technologies. Wireless ISPs operate over unlicensed spectrum. ISPs include both small, local services and global providers.

Misinformation: Misinformation refers to any false or inaccurate information, such as rumors and hoaxes. Social media platforms are regularly used to spread misinformation.

Mobile Network Operators (MNOs): MNOs provide cellular voice and data services. MNOs provide internet services through wireless technologies, operating over licensed spectrum. Many companies, such as Telekom Srbija, are both an ISP and an MNO, because they offer both fixed and mobile internet services.

Patient Capital: Long-term debt or equity investment that forgoes immediate returns for longer-term returns, often below market rate. Generally undertaken by investors with high-risk profiles seeking both profit and social/environmental impact.

Spectrum: Refers to different frequencies of electromagnetic radiation. Regulators designate specific frequency ranges (or *bands*) for different purposes, including telecommunications. Some bands (e.g., WiFi) are *unlicensed*, meaning that anyone can use them with the proper equipment. *Licensed* spectrum requires a regulator's approval to broadcast (e.g., cellular networks or FM radio). Licenses are typically allocated through spectrum auctions.

B. Methodology

The Serbia DECA included three components:

1. **USAID/Serbia engagement:** USAID/Serbia designated two points of contact (POCs) within the Mission. These POCs led communication with the DECA implementation team; helped identify key informants; reviewed relevant documents pre-, during, and post-interviews; and attended selected virtual interviews.

   The POCs also helped organize an in-brief and out-brief at USAID/Serbia on the first day and within a few weeks after completion of virtual interviews. These meetings were important to socialize the DECA purpose and preliminary findings across various USAID/Serbia technical offices.

   This engagement was not only important for ensuring an appropriate mix of interviewees, but also for building the research team's understanding of USAID/Serbia's priorities.

2. **Desk research:** The desk research used a standardized template the DECA team created, organized around three pillars (digital infrastructure and adoption; digital society, rights, and governance; digital economy). The desk research included three components: 1) quantitative analysis of open-source data and indices to produce regional comparisons (e.g., GSMA, World Economic Forum, International Telecommunication Union, and Varieties of Democracy); 2) internet research guided by high-level questions under each pillar about the state of Serbia's digital ecosystem; and 3) review of USAID/Serbia's CDCS, funding allocations, and digitally relevant programming.

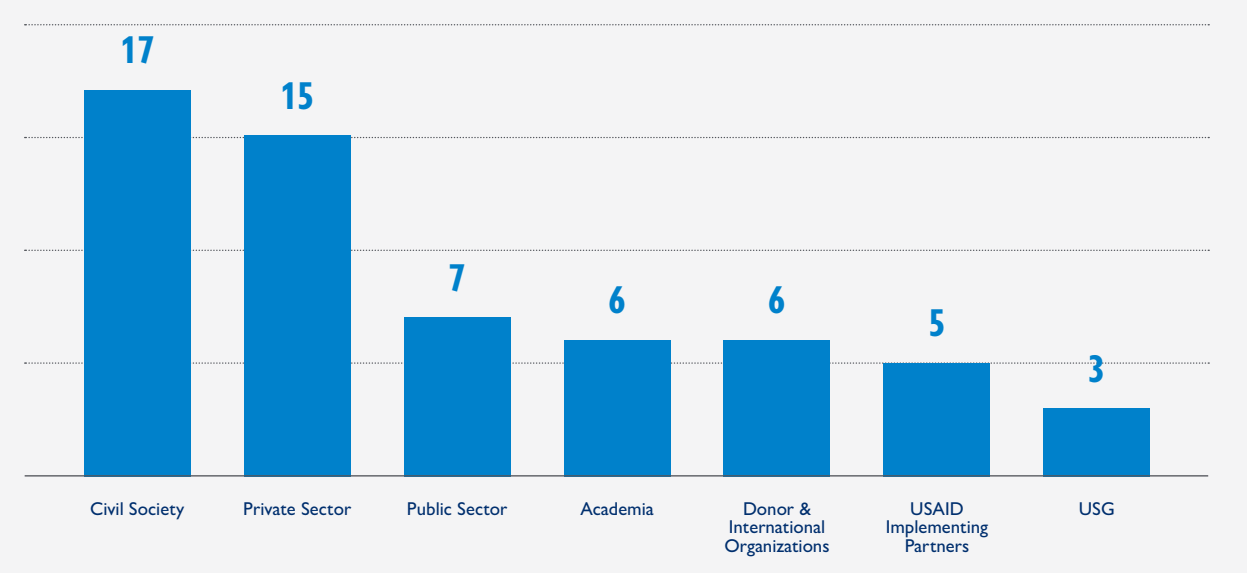
   The desk research was shared with the USAID/Serbia POCs before key informant interviews and informed the interview guide questionnaires.

3. **Key informant interviews:** The DECA team collaborated with USAID/Serbia to compile a list of target stakeholders across civil society, academia, international organizations, the private and public sectors, and within USAID/Serbia. Initial interviewees were secured through the DECA team and USAID/Serbia networks. Additional interviewees were added throughout the research process via referrals from completed interviews.

   During the key informant interview phase, the DECA team conducted anywhere from two to three interviews per day due to time differences. At least two team members — a lead interviewer and a notetaker — attended most interviews. Each interviewee responded to a general set of questions that the team developed prior to the key informant interview phase, tailoring them to be more targeted based on the interviewee and learnings from previous interviews.

   To ensure a diverse mix of interviewees, the research team evaluated the list of scheduled interviews and conducted additional outreach to fill identified gaps. The graph below shows the 59 interviews by stakeholder group (informed by 34 female interviewees, and 49 male interviewees).

FIGURE 16: Key informant interviews, by stakeholder group



Analysis

During the six weeks of key informant interviews (KIIs), the DECA team conducted debriefs twice a week. These meetings ensured that all team members were briefed on each interview, and facilitated the triangulation of emerging themes that could then be tested in subsequent interviews. Mid-way through the interviews, the team identified primary themes and began preliminary synthesis of findings. Upon completing the KIIs, the team convened to revisit these themes, confirmed their validity against some interview notes, and proceeded to organize the findings around the three pillars outlined in this report (digital infrastructure and adoption; digital society, rights, and governance; and digital economy).

Limitations

The research team's technical expertise was somewhat limiting. DECA team members were chosen to provide coverage of key technical areas identified in a preliminary review. This approach may introduce some bias – weighting the specializations of team members more heavily than specializations such as governance or digital trade.

USAID/Serbia and DECA team networks provided a large portion of selected interviewees, an approach that may have excluded stakeholders who are less comfortable engaging with U.S. Government representatives. Information is mostly limited to Belgrade-based interviewees' knowledge and work across the country. Rather than rigorous qualitative methods (e.g., thematic coding), analysis of interview notes depended on triangulation of findings within the DECA team, which attempted to balance thematic gaps by consulting technical experts and seeking out additional interviewees.

Research team

The DECA team comprised five digital development generalists and specialists.

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